Nerve aggregation (an important neuropathic standpoint) and medical free paths (armamentaria, &c.;) / by H. Elliot-Blake.

NERVE-AGGREGATION AND MEDICAL-FREE-PAINS

By

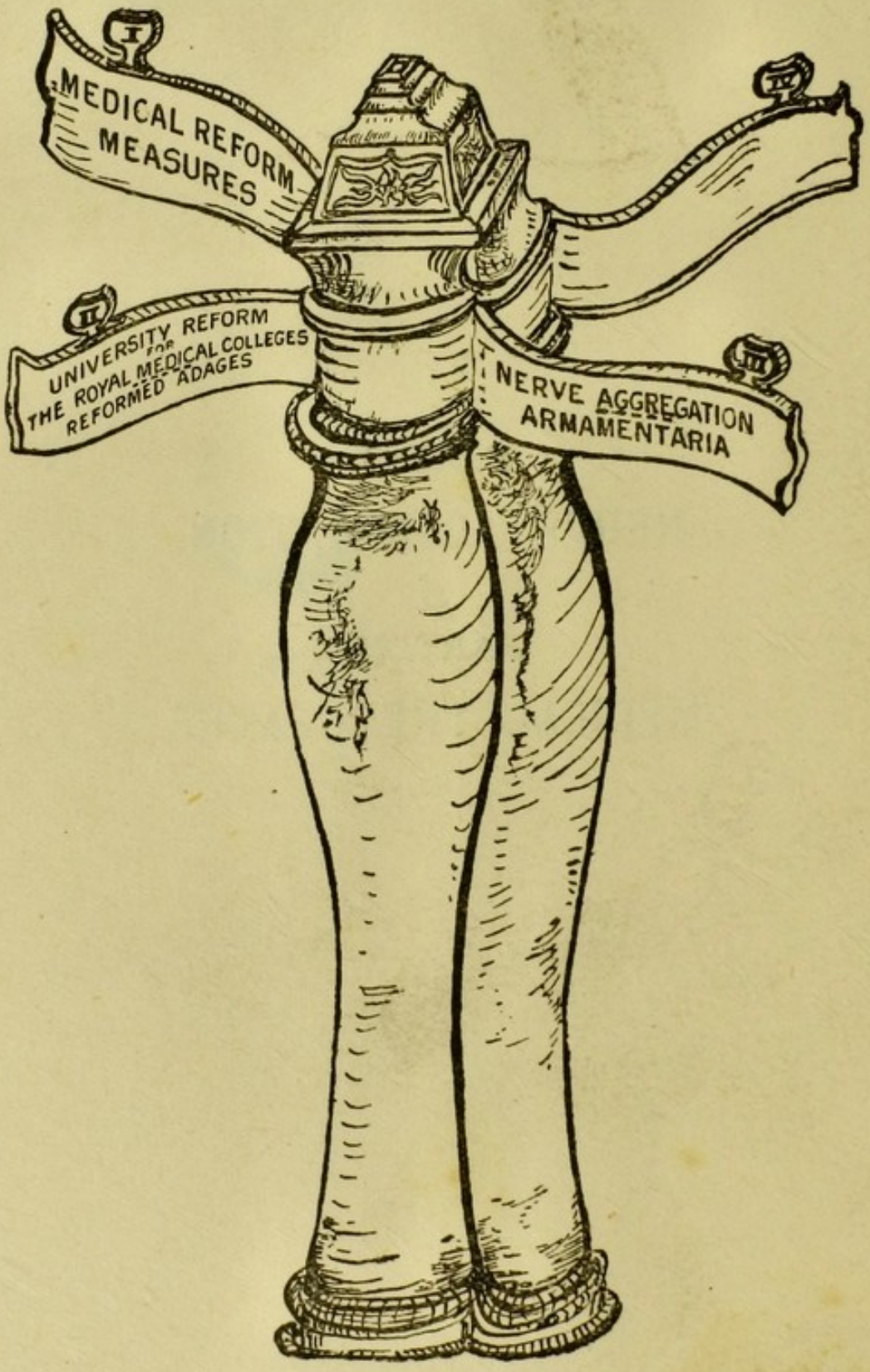
H. ELLIOT-BLAKE

PART I.

NERVE AGGREGATION.

PART II.

MEDICAL FREE PATHS.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NERVE AGGREGATION

(AN IMPORTANT NEUROPATHIC STANDPOINT)

AND

MEDICAL FREE PATHS

(ARMAMENTARIA, &c.)

BY

H. ELLIOT-BLAKE

Member of the Royal College of Surgeons of England; Licentiate of the Royal College of Physicians of London; Member and Licentiate of the Apothecaries' Society of London

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PART I.

NERVE AGGREGATION AS NERVE FORCE.

PREFACE.

THIS first subject of Nerve Aggregation was offered to the Psychological Section of the British Medical Association Meeting, in July, 1910. But the technical rule of set official speakers for set subjects and set discussions precluded its unannounced presentation and selection, blindly. This same subservience to set principle also blinds most official Societies. Once before, my own notes had led me to map out the antitoxic method to be applied to Venin, but stereotyped resistance to new opportunities blocked my way; and Calmette antedated the English application. With this there happened also to be a second note, in my note-book, on the general antitoxic action of bile, and which could still be corrected or ascribed to.

Societies too often depart from the pioneer genius of their founders. They sink their nobler purposes into supine satisfaction, cosy social amenity, or respectable oblivion, with inundated conformities—petrifying, immobilizing, fossilizing. Like with water-logged and too encrusted millionaires, a remedy for

such encrusted societies would be to break them up, and reform them amongst the new bloods, with a balance of comfort decently presented to early traditions, and the much loved, but rather useless, elderly orations.

With more newness, let each one muddle and puddle on the shores of his own discovery.

And with no help from nowhere, and consequently with no thanks to extend, the pen-brush of publication will have to serve this book and the attempt to paint my picture of the new shore.

Since the presentation of these Papers and Designs, much has leaked out and been half-dabbed, half-truthed, or half-pilfered-snug. The indication, therefore, of my whole, first-original preparations of them needs to be repeated—*before* 1910 —June, 1912.

NERVE AGGREGATION
AS THE ORIGIN OF
NERVE REFLEXURES

INTRODUCTION

HUMAN LIFE.

* * * *

"Yet, ah, how little of ourselves we know!
And why the heart beats on, and how the brain
Says to the foot, 'Now move, now rest again.'
From age to age we search and search in vain."

Extra lines by SAM ROGERS.

NERVE Aggregation will here be considered on the basis of its broad experiential aspects, and with whatever there is available to elucidate it by clinical deliberation; and, whilst distinguishing the two possible scopes of treatment of the necessary insight into this, or a kindred subject, it may not be out of place to remove some misconception about the direct need of, and reliance on, clinical deduction.[1] We obtain by it the closest practical view of the subject. And it is

[1] Compare relative and successional deduction on p. 2 of

quicker than wasting and waiting time for what amounts to a second stage of any direct first inquiry, with subsequent but detached elaborations, or too complicated documented (secondary) authorities and prolonged research, or supported with some remote historical treatise and usually bestowed on what is not new matter at all. The adoption of the clinical method has the marked and continuous advantage of immediate use or application, whilst piecemeal elaboration by experimentation, or unlimited induction succeeds deduction, and consequently has a restricted value for first considerations. Altogether, informatory induction rarely gives a combined or broad view. Roger Bacon and his fellow Franciscan Albertus held to the ancient synthetical observations of the ancients, and to facts and observational and ocular experiment. Francis Bacon, the father, or rather the familiarizer, of induction in England, must soon have doubted it, and seen its tendency to limitations, for in his "Natural History," and when he probably felt the incompetence of induction, he felt bound

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"MEDICAL REFORM MEASURES" (Vol. I. of THIS SERIES). It traverses the old notion of an inherent non-interdependenceand antagonism to induction. Piecemeal elaboration by experimentation, or unlimited induction, ought to come *after* deduction.

to declare he had "served his name better not to have published his Natural History" on which it rested. Of course, it would be an execrable breach of chivalry to judge a great thinker by idly prying into a mere blunder or a blemish, or a bare admission. Such mote finding only belongs to erudite criticism, and scholarship detail; it does not alter, and it leaves untarnished, the good, the work, and the original and independent thoughts on which the world, humanly speaking, moves forward. Still, it may fairly be inferred that, in spite of co-relative value, a good deal of analysis, ceaseless accumulation of facts, and inert scholarship too often does remain uncombined, undigested, and fragmentary in dismantled disconnection and disorder. On the same side, Comte, speaking of religion, says our tenets pass from those fictitious to those abstract and positive. So elaboration, research, and an array of quotations may be looked for popularly, but it does not institute or help anything in the way of new movement. And, more often than not, it is solely used to cover want of idea, and to parade the store set on perfectly correct but only the grammar of made-up literature, or rather non-literature, which is worthless. Original independence of idea does not come from that source; and clinical deduction

in the past has more often supplied more direct food for the latter. Perfectly easy and grammatical reading, like a novel, is essential rubbish, and the habit of quotations never strictly applies, except at first hand use, and on which Medicine has never had to depend for discoveries.

Deduction often must be the only possible forerunner to primary reason and it leads to the ground for discovery. Indeed, speculation ought to precede experiment. Mere observation, or the horrible lists of case notes, or chance experiment, or research copy can only occupy a secondary sphere. Really, *Deduction* should not be ignored so much in Medicine, for, even at the side of induction, it mostly substantiates and co-ordinates the ragged ends of inductions, focusing to a practical presentment the unwieldy masses of good, bad, or indifferent inductive accumulations, and their respective facts.

The adoption of the clinical method, then, has the marked and continuous advantage of immediate use of application.

A few short sections of application may now be taken to summarily interpret the main purport and the claims of this system :—

A Pounding Reflex.

(1) A POUNDING REFLEX, as a sensitizing or cutaneous reflex, increases the ordinary Deep Reflex. As an example, this may be invoked by hard rubbing and pinching over a cutaneous reflex area, as the inner side of the knee ; and this stimulus added to the direct deep reflex, as with the patella reflex, promotes an increased or improved Reflex. That should be called a PATELLA REFLEXURE. Therefore, that must be an *associated* condition,[1] and not the old *simple* reflex.

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[1] It does not indicate a Jendrassick's sign, which is only a same path or *direct* sign. Nor can it refer to a salt stimulated surface of the brain, which latter, I suggest, probably, only increases the electrolyte action, and only for the laboratory or electric method. Neither does it apply to the usual *direct* electric or motor-central phenomenon, also an electric method.

But the *Pounding Reflex* or *Sensitizing Reflex* is distributed *via* the *indirect* and short association fibres, and independently of the laboratory or electric method. It is also really an *added* state, in front of the second stimulus of the Deep Reflex.

Likewise, in another region, with the lower bowel pressures, I maintain, it not only plenarily operates the Rectum Centre—and that not by a relaxation or inhibition, as the older theory supposed—but it helps to activate the Colon Centre higher up, through the *indirect* and short service circuit of nerve-fibres.

(2) Many people can partly test a plate of fruit for sourness by the eyes and smell, and previous to tasting. That must be an association of ideas, not a direct reflex. It clearly shows an outside course for the preparation of a reflex centre.

(3) If the flavour of a fruit be known, added sugar often increases the power of the centre for taste to appreciate and enhance it. That, too, doubly and independently increases the single reflex, Therefore, approaching or culminating nerve-channels habitually exist toward the same nerve centre.

(4) The "pre-occupied state" in the brain-cells sometimes intercepts a sudden call or thought; and that *lapsus* is due simply to a less practised action. The *added state* of the former stimuli, *alone* accounts for the pre-eminent occupation, or previously greater "pre-occupation," of the brain-cells to the exclusion of the less practised stimulus. It may be noticed, it has nothing to do with the ridiculous phrase of being "absent minded," or without stimuli.

(5) A mountain climber's collapse is not a direct reflex, but due to accumulations of the *antecedent* worries of an arduous climb.

(6) "Instinct" in Animals or Monads—*i.e.*, long before direct Knowledge—is nothing more than unconscious Habitual Regard (stimuli), aggregated or practised, and unconsciously set off by any small associated stimulus.

(7) An illimitable number of other nervous causes and instances are to be attributed to this accumulative interpretation.

The object of this book will be to supply a simpler arrangement, and a wide systematic principle *to assemble the origin of nervous conditions.* It treats of nerve conditions on the basis of a new aspect of origin of nerve-energy, and answers many unknown questions in reference to the occurrence of, and upholding mechanical thought, neurasthenia, hypnotic suggestion, hibernation, and the activation of the hibernal gland, or sleep, the action of the centres in the brain and cord, or the nervous nature of respiration, fœtal delivery, the wonderful puzzle of sexual instinct, defæcation, and menstruation; and, in fact,

it may be applied to any of the multitudinous other terminal nerve actions. And, with this one step traced over the limit of our knowledge, *a peeping into futurity*, leading to a discovered shore.

This introductory nerve basis may find acceptance, and be used both as the line of future inquiry, and for a hold on the clinical antecedents of and bearing on many nervous and functional diseases.

In an introduction, too much should not be expected. The short words of an introducer never can complete nor tidy up everything along every line of the thoughts opened up ; it just prepares the way for the developments of others. And even though the original course be sound, the limitations and deficiencies are only too well known to the author. So, with this avowed reservation, I prefer to think that the best critic is the best helper, the one who offers to be a good supporter, after understanding the line and the free path opened up.

Again, the world of Science is too extensive for some part anticipation not to have occurred, *besides the wrong or partial anticipations of the meaner gas-bag writers who get wind of a new subject and spoil and smudge the freshness.* Yet, I do not recognize the more genuine grounds of

Hoffmann (1660-1742), who thought that a "vital fluid" or spark imparted a "tonus" or vital principle to the nerves and muscles. Tone, too, in the modern sense, is a question apart, and only refers to muscular growth, or to healthy or increased capacity for work. Still, for any part or division that may have been anticipated, I can only appreciate the foresight of others, in what I have regarded as unknown; and, whatever the previous inquiry, so far to extenuate the circumstances with the solace that my own results have been arrived at independently.

Nerve Aggregation as the Origin of Nerve Reflexures.

CHAPTER I.

Nervous Aggregation.

The direct reflex of all nervous conditions has been the only one taught in the text-books about nerve reflex, and it refers (Mott) especially to the single force of the origin of a nerve reflex centre, or of the autonomous central origin of the vegetative centres of the cord. Nervous Aggregation, on the other hand, deals with all the origins of nerve stimulation. And, instead of the old single origin, it substitutes the accumulative effects of origins in a Multiple Reflexure[1]; and it claims to be the only nerve factor of origin both in physiology and in disease. This will be called the accretion nerve factor or the aggregating and sensitizing nerve factor of origin. It starts from the beginning of Nerve Reflexures, and does not interfere with the physiological and laboratory

[1] A special term referring to this system, and the prepared nerve cell.

phenomena, or any former muscle, nerve, or reflex preparation.

Again, there must be something more, surely, than the physical or electrical origin of nervous reflexes, and so much insisted upon in the text-books. It was doubtless built up upon the introduction (by particularly Helmholtz and Hitzig) of the electrical method of investigation, and the apparent corroboration by the single (*strong*) electrical reflex paths of Hitzig's, Ferrier's, Horsley's, and Sherrington's nerve centre localizations, and accentuated since by Waller's electric reactive experiments, and his nerve degeneration and muscle-nerve and negative variations, and other similar laboratory researches. Previous to that, and from the chemical side, Liebig has led the ideas towards cultural and physiological or bio-chemistry, and laid the foundation of a chemico-electrical predisposition for physiological views.[1]

In Liebig's opinion all body action and functions were in nature chemical, and therefore accompanied

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[1] I feel inclined to draw attention to the chemical side of this debt that we owe to Liebig, because I was naturally drawn to it on account of my father having worked in his laboratories at Giessen, and about the same time that my old master, the late Professor Williamson, of University College, London (a teacher

with waste and discharge. And these are now supposed to be associated with ionic or electric changes of potential. But why not observe the physical changes, too? No doubt the electrolytic material, and soft fluids, and some dissociation lends colour to electric excitation and division. But with electric conduction over long distances of nerves conductivity alone is very much hindered by proteins and other non-electrolytes. Hence each neurone and nerve cell in the latest electric view is in a way described as practically a battery, in their view, and discharges its current or action current. In this connection the string neurometer or galvanometer[2] is supposed to support an electrical discharge, varying from 20 to 100 oscillations a second. However, it

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who made you swallow dictatorially, and repelled me), and my uncle, the late Dr. Sheridan Muspratt of the "Chemical Dictionary" fame, who also studied there in their pupilage. And although the main chemical branch remains, it shows how very rapid have been the strides in organic and animal chemistry since the start of that very strong Victorian period.

[2] So far the Simple Reflex has been accepted. But the apparent gap must cover something, and the gap immediately disappears under primary and natural aggregation. And I believe it accounts for it. It is also known that these secondary or merely coarse electric reinforcements may continue to show

seems to me very doubtful why electricity should alter its short oscillations. And the independent rhythm of the muscular rhythm of Horsley and Schäfer need not necessarily depend upon the battery state of the nerve cell connection. Indeed, in my view, it need not even be due to electricity. So, in application, a more suitable clinical interpretation must be given. And, in a different way, surely electric planes exist everywhere, wherever physical or chemical disintegration action goes on; and that alone will give rise to naturally oscillatory or electric tension surface fields over the body, and also in the nerves, and in the way of altered chemical states and traversing electric currents of local variation. These would very indirectly, if at all, depend on the function of the more distant nerve cells. The alternate corollary to that negation must be a simpler, or the physical, or mechanical primary energizing of the nerve cell. Clinically, at every turn, this can be recognized, and the power or nerve energy of the nerve cell, the mechanics of the very active and unstable living nerve cromatophile or other mole-

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the time discrepancy, with or without the aid of the string galvanometer, unless the direct electric augmentation be induced by a disproportionately strong electrical current. [Natural N Reflex = T + a (a + b = tonic and the laboratory strong nerve current). (Factor of Inquiry.) = T = X (gap + current of nerve), X = Nerve Aggregation].

cules, depends upon a mechanical gathering and activating function ; and on that gathering function depends the consequent increase of nerve and molecule activity. *I regard that gathering function of the molecule as a natural law.* The conversions of Steinach, Grützner, and Boruttau only refer to negative variations, and which I also class as electric field variations. Whilst the increasing mechanical activity is quite sufficient to originate the living nerve cell activity[1], clinically, too, the origin of most impressions, and traumatic and painful nerve transmissions, can undoubtedly be exclusively traced to many mechanical stimuli.

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[1] As to the Natural Rapidity of Nerve Transmission (apart from a Foreign Electrical Origin), it would help us if we understood the known velocity of more direct and inverse chemical reactions. According to J. C. Phillip, in his mathematical and not very real book or view of chemistry, Brownian oscillation is now supposed to be a molecular movement, and burst nerve and other cells show this granular or bioblast extrusion and movements. But it may be purely physical.

A Law of Universal Rapid Action.—This Law of Universal Rapid Action can well be imagined as centring around all matter, but varying in flux or rapidity within the hardest to the most attenuated matters, and in *whirl-buds*, rather than the idea of energy with bombardment excursions. In solids the

Nerve Reflexures, Nerve Centres, and the Mechanically Energized Autogenetic Nerve Cell.

The term, multiple nerve reflexures of origin, or, for short, *nerve reflexure*, will describe my own term and view of multiple impressions of origin ; and so as to replace the former *single nerve reflex*, except as a direct and simple path.

Early origin of Nerve Cells from Muscle Cells.—

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buds would, it is presumed, contract or shrivel hard (freeze). And in living plasm, and consequently in nerve matter, these *whirl-buds* will be very loosely represented. The rapidity of the changes in the chemical matrix being obviously most rapid in the unstable living cell's molecules, it accounts for the rapid stages of development, or as I call it *chemical accretion*, in the one prime cell ; and hence the gathering together of the rapidly-formed subsequent millions of inter-relational cells and their actions within the physiological adult mechanism. The still higher and specialized nerve transmissions, and nerve cell centres, must also represent an extra rapid series of changes corresponding to the law of Universal Rapid Action. *So, the quickness of nerve transmission, on the ground of natural stimulation, does not need electricity to explain it.*

Nerve or Verve Genius, *as a mechanical Nerve Phenomenon*, has nothing to do with rapidity of thought. Perseverance and slow determination tend towards the essential new thought, and are far more characteristic. Genius alone develops its own new thought, and all subsequent elaboration lacks the verve of genius.

To go back to lay the foundation at first signs, it will be necessary to search for a primitive function in cellular protoplasm on a mechanical and clinical basis, and discard the vitalistic basis. This path only leads on to Cyto- or Primo-genesis, so it does not dispute Histogenesis, although the three primitive blastodermic schematic lines in the latter are not real, and will not be adhered to.

Taking a *norm* to demark a part of physiological bioplasm, for the descent of one attribute function, the contractile norm will be one of the earliest to differentiate, and it has been formed, or particularized from the primordial, early chemical or *glandular* germ, apart from the other molecules in the molecular republic of the cell as the chemical unit of life (*plus* a law of Accretion, as an explanation of supposed consciousness, or rather purpose). And that *latter* part of the cell accumulates generally when developed into the full form of the musculature cell. During development the contractile norm became the responsive part of the bioplasmic mass, and then impressionable and contractile. Afterwards, in mass, as in the simplest forms, or in *Vorticella*, or in *amœba*, it is seen further to accumulate and keep converting mechanical impressions into activity

and contractile propulsion. This must favour some rapid chemical exchange in the norm and muscle. And, similarly, when digestion propulsion develops, this chemical exchange obviously increases, and it also may be taken to represent one of the earliest beginnings of the associated mechanical and chemical relation, or functional exchange in the musculature norm ; and, by one step farther, it is differentiated into a still more complicated stage and organized growth and rapid action repetition around the contractile vesicle. Even thus early, many impressions, as movement, fluid contact, food, debris irritation, waste, and dilatation impressions, *rarely or never only one impression*, habitually stimulated the chemico-molecular activity and the contractions of the cell protoplasm. In the primitive state, then, the environment supplies a regular bombardment or multiplication of mechanical impressions to the primitive contractile norm, and enforces the more complicated chemical activity of the unstable molecules of the cells, and these would be in the form of light rays, chemical exchanges, metabolism, and from all other outside conditions. In part, this will be further referred to. This happens, just like heat or concussions bring about chemical action, and it acts by attraction or a gathering function ; but that

must be referred to in another section. In the next and subsequent stages of development, long after the norm differentiation stage, as *gland* or *muscle* specialization, this form of multiple impressions or aggregation, as in Nerve Aggregational beginnings, must certainly increase in complexity, and not, as at present supposed, dwindle to one solitary reflex.

The first nerve cell would be a differentiation or extension of the supersensitive nerve norm, a set of molecules slightly differentiated from these two sets of molecules, or as conditional between the two parts of these contractile or sensitive, and the contractile musculature cells. At first it would be restricted to a connecting cell, or to a filament between the same musculature cell in a simple organism ; or afterwards to a differentiated nerve cell between one muscle cell to another. That first nerve cell line, with consequent nerve transmission, during development would be largely due to increased activity, and subject to many more than one, and indeed a constant *series* of impressions, and so making those nerve molecules more active. Its function could only be activated and continued in growth by habitual *multiple* impressions. And, following the contractile nerve conditions of the contractile-musculature norm cell, the first im-

pulses would not be electrical, but environmental or mechanical. And the normal impulses would not usually be single, but start from *many origins* inside and outside the organism: as from light, from many other rays, or from water, salts, from food responses, and from the body's actions and exchanges, besides those already mentioned. Doubtless, long after the earliest chemical units, the complex living molecule opens itself to wider affective influences than the more easily started inorganic chemical molecular exchanges. The spongy texture of, and Nissl granules in, Nerve protoplasm accounts for nothing; it is this suggested looser or impressionable chemical nature that counts for all.

Right through all the higher and continuous developments and the various sensitive differentiations of the muscle cell, and the impression cell, and the nerve cell, there runs this increasing and dominant impression and necessity of excitations, and it promotes activity, and promotes the recognition of more numerous concomitant reflexure fields of origin. That is my view of what may be called chemical and mechanical environment. It lays down the one clear multiple mode of sensitization of the neurone system, and the mechanically energized single nerve cell, and,

as it increases, it forms the multiple-celled centre.[1] And for the autogenetic nerve cell centres, it requires, not, as at present held, a single nerve reflex, or even a vitally self-acting power, or even an involuntary vitalistic state of the cord centre, or electrical autonomy, but, according to the lower or higher scale of development reached, an ever-increasing number of widely distributed connexions and collections—an aggregation of mechanical and corresponding nerve impulses.[2]

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[1] This refers to the food or chemical cell composition around the nucleus—and that the nucleus probably attracts it, and it increases Activity. The nuclear-tropism centres the life of the cell. It probably does not "preside" over the cell, only reproduces.

[2] In answer to the most recent and unexpected discussion at the British Association: No anatomical structure can ever forward the single or central area lately suggested by Professors Darwin and E. Smith for all experience or recollection. My present aggregational and separate view insists upon separate centre collections; and then the final impulse that invokes each must always be fresh. Again, my view of the numbers of autonomic centres is definitely proved by the fan-shaped spread of the mesencephalon to the numbers of self-contained centres. It thus fits the individual function of cellular, physical, and nerve cell aggregation; and it usefully indicates a separatist or a local road for every development.

The brain has not conglomerately developed from specializing a large single storage area, such as the hands and feet (like an insect)—*i.e.*, from a local environmental effect, and which is

CHAPTER II.

Nerve Tank Cell Phenomenon.

The old view, lately shared by Professor Smith, premises a storing of memory and experience. It would be the old time automatic centres, inherently acting, unconnected, and entirely leaving out the degrees of training.

The new view of Nerve Aggregation accounts for the whole process, as one gradually opening up each set of nerve cells aggregated (common meaning) in an Autonomic Centre (combined, not automatic). That is, the cell paths will be opened to all the usual or other aggregated (special sense) storage stimuli for that set of cells, but only brought into play if *also* encouraged by an activating or exploding effort. No innate or single stage, but a practised thought-run, or habitual Nerve Aggregation.

Many of the causes of origin of Nerve Reflexures

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not hereditary (*v.* Bio-Moulding section), but because of the moulding effect, whatever it was. I believe the latter to have been due to a gradual aggregational, arterial or nutritional demand; and developed by a marked diversity of pabulum—the single great characterization of Primates, and very early practised. And the same improvement continues to this day.

must end in the nerve cell, or the nerve cell centres; indeed, their whole object is to accumulate their impressions there. And not until that accumulation occurs can they sensitize the nerve cell and transform or energize the central nerve cells, molecules in one part, or in sufficient chemical places to alter the cells into their functional activity, and accompanied by some microscopical chemical change as indicated by the well-known swelling and central contractions of the chromatophile groups, that is an increased activity.

The actual mechanical conversion must be of a simple order, but whether caloric, or mechanical, or contractile, with some chemical exchange, or partly vibratile, and most probably essentially active and nutritional in character, as in the glandular origin of cells, must be left at this point. But the evidence of constantly recurring exhaustion, and then re-recovery, points to a non-detrimental process; and, as indicated, it favours the nutritional or promoting chemical exchange, or increased activity of the protoplasm.[1] As to the action of

[1] Experiment: The rapidity of chemical or animal atomic chemical exchanges has not been tabulated, but that relation must occur. It is seen in diffusions and chemical reactions, but they have not been counted yet.

the nerve cell, varying quantities of irritation would activate the unstable molecules of the cytoplasm and active nucleus[1] into a state of movement; the last stroke being sufficient to determine or explode the action of the nucleus and the nerve cell. And by the nutritive exchanges of the cytoplasm would act, and when irritated, in connection with a contractile tension. Graphically, and not absolutely accurately, this

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[1] The nucleus of cells may probably be regarded as an amœboid body (*formative*), and so account for its great and attractive activity and importance. The part and functional state of the cell, or of the food cytoplasm, is as a proneness, and only developmental towards the nutrient attraction—a nutrient symbiosis—and specialized for each placet or organ cell and chemical norm. So, the nucleus does not preside over the cell. It feeds on the cell.

The Protean Molecule (chromatophile, or argentophile, or any other norms or names do not alter it) is characterized by its extreme lability in chemistry (whether enzymic or not). And apart from the soma or nutritional part of the cell the Nucleus Protozoon—by the Law of Constant Accretion or flux—goes on chemically exchanging and then dividing for countless generations before being repressed. (The present and old idea of fixed Nerve Cells from the germ is another false canon.)

No other inorganic molecules approach this lability, without its water molecule. Any grouping of sexual sides only shows chemical side combination or juxtaposition—even in the ultra-elaborated order of man's nutritional sexual organs, and best fitted for his most active protean reproductive nucleus.

This protean molecule is thus probably due to two-sided

section may be more conveniently reviewed, by looking at the nerve tank cell phenomenon as not unlike the process of a flushing tank, filled gradually by an aggregation of impulses and then overflowing; so that the continued contractile or mechanical or vibratile accompanying transmissions would be discharged.

NERVE FORCE AGGREGATION.

Just as a crystal waits for the single force of formation; so each Nerve Cell (like all cells) has to wait for its *multiple nerve force of propulsion*—AGGREGATION. A nerve cell, being a lithargic cell, requires more sources of supply than ordinary or direct cells. All cells, probably, require more than the old style single stimulation.

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action—not one biochemical side as heretofore searched for—namely—

(1) The Water Molecule, that conduces to its lability (far and away the most important recognition).

(2) The Chemical and Amido group side, and that alters each character of each special cell. Fischer has only worked on that elemental side.

The (1) or complex side helps to give rise to the cellular or molecular characteristics of receptivity, assimilability, irritability, adaptability, and *excites instability* and alternating changes, and invokes the accumulative activity, whatever the molecules are scientifically called. Names cannot matter (except to grammarians).

Mechanical Nerve Transmission.

If nerve transmission be regarded as extending through atomic spongy spaces or a sponge-tube texture, then it will well account for the flow of a mechanical or hydraulic or tension response, and in the form of a vibratile, contractile, push, or a mechanical, or ciliate (*e.g.*, auditory) nerve conveyance, with a similar mechanical conveyance tension from one end of the tension string of a neurone right through to the other end of the system. As a common proof of this mechanical power of transmission in Nature, a tree, if tapped on the boughs, will vibrate to its last ramifications. Here, as in other forms of living cells, mechanical energy—shaking and its conversion—has a considerable influence on Nature and growth. The mechanical influence, as observed on the growth of the trees' cells, can also be traced in the conversion of wind strain into a continuous compensatory cellular growth, and strengthening and supplying a resistance due to overgrowth. The tree thickens in that part only—against resistance in the affected areas. In the

Human, fractures and rickets will now occur to the reader as following the same direction of mechanical conversion and repair examples. Huge lengths of air and water, too, can transmit push or mechanical impressions, as in marine sound signalling.[1] Sound and probably light emissions are projected in the same way. And even the thin Hertzian waves, and other minute rays, have been credited with an unknown corpuscular energy. I sometimes fancy Electricity may be also a light gas, extremely attenuated; if so, it may partly act in this mechanical way if sufficient pressure can be made. Likewise with the semi-solids of man's tissues, if kept tense, they will respond to thrill or push impressions of the tendon and other reflexes, and which can be distributed fairly widely from the initial place of contact. Other physical or ergogenetic examples may be cited: as in nerve transmission, and as push or buffer nerve action, in heat, or touch, or weight impressions, walking pressure, or in sight and hearing, pain, and most of the stronger mechanical conditions; also in chemical or physical changes, in alternating electric action, and in local tickling, pin-pricks, or

[1] A wave of any kind formed in a closed room travels with only elastic flow of energy. (See Note on Law I, Section, Bio-Mouldings, p. 179, Note [1].)

blow-pressures. All these can be converted into mechanical readjustments of molecules, and so promote nerve-cell action. Indeed, there can only be rare occasions for the intervention of separate electrical stimulation for general or clinical purposes, or outside the laboratories. Here, clinically and generally, the mechanical chain of evidence is complete.[1] Even the opposites, as thirst, hunger, or weariness, should be

[1] The chief support of the theory of the electric origin of the nerve impulses relies on the galvanometer and the presence of electric currents. But, besides being too feeble to have any effect, their more or less universal presence, and the constant presence in other tissues, and in all chemical actions, must tend to be non-differential, and practically a tonic condition ; except with the enormously strong laboratory test. (The usual electro-mathematical formulæ do not explain the transmission.) And, certainly, the varying degrees of ordinary stimuli to nerves have little or nothing to do with electricity, whereas pressure stimuli are well adapted to all the circumstances of nerve stimulation, and they can be demonstrated : from a blow to tickling ; from heat to the play of light upon the eyes or our well-being ; from muscle tone, as muscle pressure to all pathological chemical action, as Caries, or chemical physiological actions.

As to the medium the new condition of a physical substance will be explained as a probable accompaniment of atomic structure in the subsequent Section on Bio-Mouldings. [*Vide* p. 180.] That substance provides an unbroken chain for the immediate delivery of nerve pressure influence in any degree, and in an elastic way from their sources, along the nerves, to the nerve-centres.

regarded as dependent on the *negative absence* of the accustomed or corresponding positive and ordinary chemical changes of food, &c., or the accompanying positive mechanical stimuli.

Of course, after voluntary fatigue of a muscle-nerve preparation, make and break currents cause what may be called "*extended*" or "*new*" contractures; but that only demonstrates that *subsequent* or laboratory electric excitation[1] and electrotonus are strongly added states, and therefore things entirely apart from the ordinary impulses at work in natural or mechanical transmission.

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[1] For Clinicians.

In Galvanism, rather than the old view that it improved nutrition, it more definitely accumulates the stress, store, or force along the nerve channels and at the receptive termini. That will heighten the ease and flexibility of ordinary and mechanical working discharges in the damaged cells of paresis. It is thus important to practise short of fatigue and exhaustion, and mild and often rather than too strong.

CHAPTER III.

Nodes of Ranvier.

I believe the unknown use of the Nodes of Ranvier may be to serve as joints, and also as convenient paths of nutrition. If the nervous system be of contractile normal origin, or associated with that style of cell function, then the internodal cells will help the mechanical nerve transmissions. Developmentally they are early associated with the muscle-nerve or mesodermic system; although by some apparently relegated to a later nerve development. Anyway, the actual constitution, the semi-solid and semi-fluid condition of the nerves electively favour the transference of mechanically-propelled impulses, or the transmission of mechanical energy. Testla only with difficulty conveyed electricity through water drops, so a semi-fluid medium is not so suitable for electrical as for mechanical transmissions. Indeed, following this out, it makes the electric transmission unnatural. The conditions, too, are probably slightly

more solid in the naked and laboratory nerves. The multiplicity of nerve endings would not be required if one kind of electricity alone energized. As indicated above, I regard the Nodes of Ranvier to be nutritional lymph approaches, deriving nourishment from the lymph ooze of the tissues. Also they act as a local provision, following the former local or sectional contractile stems, and not developmental to the distant cord centre connexions as held at present.[1]

The Nodes of Ranvier thus supply the nutritional purposes of the internodes. In this way, there will be no need to go so extremely far afield as to continue to attribute the old nutritional purposes to the terminal cells of the neurone, or to the multipolar and anterior cornual cells of the cord as under Wallerian degeneration. These interminable cornual cells of the cord have quite enough to do as storage

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[1] The Developmental Scheme would be: (A) Muscle-Nerve Development Scheme; (B) Neurlemma and Cord Development Scheme; (C) reaching the Broken Muscle Development Scheme. Each scheme would thus have to provide for its own *nutrition*—not as held at present, all depending on the Nerve Cells of the Cord. The latest work of Peroncito and Cajal on the Regenerating tufts of nerves in any position supports the above, and breaks down the older central or Nerve-cell Influences.

tank cells, and they must be occupied with mechanical conversion, and with their own nutritional repair (and with the food changes to their own independent Nuclear Amœboids), and also with their own function, and for local connexions by their processes. No doubt, on injury to these cells and their axon paths, the axis cylinders degenerate, and they may be picked out by stains, and so on, but each nerve length section still feeds only as an internodal cell, only under exposed and less excitatory conditions.

Bearing in mind the above musculature norm as an impression cell, following on any damage to the central axis, the axis function alone will be abated, and the degeneration of the axis will be accounted for by the consequent loss of activity and corresponding local or sectional mechanical nutritional, or a molecularly altered, normal reaction: and those sections cut off from functional use alone degenerate. It simply limits their usual *local* nutritional activity through the Inter Nodes. In fact, all other cells in the body and their tissues do exactly the same; and there is no good reason why the muscle cells, and musculo-nerve cells, or nerve impression cells, or nerve processes, as derivatives, should not degenerate likewise.

Wallerian degeneration from the polar cells does

not take place ; it is due rather to functional loss of tone and local interference. If this be so, another function has to be found out, on the muscle-nerve-cell analogy, for the internodal combination of the sheath of Schwann. The nodal cells must now be regarded as cells, and being contractile they play a slight and delicate part as so many contractable *relay stations* or sections, for a certain distance from the first push or other mechanical impression-focus. Every nerve feels in its way by its nervi nervorum, and probably the nervi nervorum help to retain the appropriate contractions, and they may also assist in an arterial-nutritional way.

However, I am not prepared to say that the electrolytic salt exchanges may not also be assisted (*but only as nerve tone*) by this peculiar and hitherto unexplained central and nodal provision. At any rate, the arrangement cannot be so single or central only as was formerly supposed. The length of this effect of the internodal-cells will be curtailed inversely away from the impression-focus by relative distances. In longer lengths, along the lines of nerves, the internode, or even the external parts of the axis cylinder when the sheath is absent, will serve to maintain the sponge-tube-like centre, and with it a normal tone or

proper tension within for the fuller transmission of the impulses to the receiving cell stations or centres. The internodal cells besides slightly toning, or even contracting, so as to relay any feeble impulse for a short distance, would also contract to absorb or counteract any excess or overstrain by a local stimulus, absorbing much dangerous and excess energy that otherwise would disorganize the delicate receptive nerve cells. This arrangement, *better than any other*, satisfies the mechanical side of the clinical facts, and, thus, these internodal cells, with tube sheath, with or without the absence of Schwann's sheath, will keep the delicate axis cylinder and nerve cell processes under a constant contractile or sponge-tube strain, and free from kinking. This view is all the more enticing on account of the musculature norm origin, and as a general function of cells, because the muscle cells in a similar way limit the conveyance of their vibratile tremors within their length and strength.

Clinical Application.

From the clinical point of view this system connects up, not so much the irregular tonus or muscular toning, or muscular impressions, as the numerous

peripheral and normal lines of nerve impulse impressions, *a far more important affair*, and makes use of them by accumulation. And by gradually filling the plasm of the nerve tank cell it increases the chemical exchanges, and so activates the cell with its amœboid nucleus.[1] *The cell and nucleus become more active.* It acts first by gradual storage, and making the cell more sensitive, and when the nerve cell or centre has been thus fully sensitized, *and only then*, can the nerve cell be exploded by a final, exaggerated, or local discharging impulse.

Climax Impulse. — This last or master focus-impulse is an equally important feature to be borne in mind. And, being the last impression impulse to throw the nerve cell into a mechanical strain or increased functional duty, it completes the nerve tank cell phenomenon.

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[1] It is difficult to imagine the base of life—as we see interrelation and symbiosis and parasitic dependence around us—on any other basis than, I believe, to recognize the nucleus of all cells as amœbic centres. It explains the continuance of life, and the attraction of food to that cell. Man is, of course, secondary to that. Indeed the cytoplasm need not be regarded as alive—but nutritional, or at any rate not so alive as the chemical nucleus. (Man (*his outer shell*), therefore, is, more or less, a dead or an extraneous development.)

As to the discharge, after the physical irritation of the molecules of the central nerve cell structure, it may be a conduction as at present surmised; or if the musculature origin be accepted, it will more likely be a contraction or vibratile ramification. And, in action, this is corroborated by the vibration of the rods and cones, and with Corti's body, and probably the *digestive cells*, and gland excretion, and hair-cells. If we trust to the clinical relations, then its chief experience is also a mechanical flow-discharge over its cellular processes, axon, and dendrites.

Under this principle of collective nerve cell sensitiveness, every autonomous, or erroneously called "involuntary," nerve centre in the body, brain, and cord gathers for a certain space of time *force of irritation* from any number of sources, and thereby provides for the continuance of its function, even in a slightly abnormal or *tired* state. And this latter provision is a great support to the system. For this provision for a relatively tired state constitutes a well marked CRITICAL PROVISION. In fact, the well-known recuperative elasticity could in no way be accounted for by supposing only a vanishing, emptying, and obviously an immediately exhausted single reflex.

First, take the higher faculty cells of the brain,

some of the common and constant renewals of energy or impulses will arrive from the well-supplied basal ganglia, and other sources to be mentioned; and especially for what Locke called the "faculties," or as I would rather add, faculty-cells of the brain, and which he declared to be due to "experience"; whereas experience only, and subsequently, supplies control (after being well prepared), and from much wider centres of energy and co-relation. For the faculty-cells and for common and everyday actions, too, and for the common special nerve centres of the brain generally, numerous other sources of constant energizing and renewal impulses will be received from their respective, common, or special energizing areas, such as: (1) From the cord and brain; (2) the ganglia of the special senses; (3) the sensoria; (4) from light, and the sun, and other rays; (5) directly from sight, hearing, or the internal organs, because rather more widely distributed; (6) from outside services, as the air, mechanical pressure, noises, chemical action, food, heat, cold; (7) in other directions from all the brain-cell connexions. And that narrowed summary of the activating series of impressions indicates only the range of an exhaustive list.

After the perpetual, or relay, nerve impulses and

accumulations have sufficiently irritated or sensitized the tank-like nerve cells, they are prepared to receive a last impulse from a trained discharging station; or possibly from a Pacinian corpuscle (which may also work from contraction), or from any other of the origins of Head's chain bundles in the common compound nerves. And so, in that simple way, Nature has conveniently plotted the nervous system together, and every nerve cell centre may be mentally and clinically pictured as attached to a number of irritating services; and also with a final, convenient focal *climax station* of origin as its last peripheral discharging point or small area. The continuing overflow proceeds by mechanical, vibratile, or a sensitizing tension to other centres; and thence to other cells or organs of the body *via* the axon; and by the dendrites to other path connexions.

The Law of Excess.[1]—It is due to this picking up, and continued sensitization, and unresisted supersensitizing that nerve growth has proceeded, and has led to an ever-increasing overflow development, and

[1] One instance is given here. But a universal Law of Excess governs growth and other chemical origins. The larger reasons will be reserved for an equally important occasion and an original section, later in this book.

thus often ending in a functionating development, or an increase of nerve cells wherever there was stress, or when extra response in number was required.

Following this same response to every specific specialization of activity, we have obtained the gradually increased types amongst the nerve-impression cells. Each part of the nervous system has become suitably sensitive for their specialized differentiation or function. This applies to the nerves, and all other cells too. It accounts for the continuous activation or growth right from the nerve norm ; and from which it is almost inconceivable that an habitual single reflex could ever vary sufficiently to accomplish such continuous development. In a similar way, it accounts for the local increase in the stations or number of cells in the region of relatively less, or extra active, " nerve centres," and for the congregation of nerve cells in more ambitious and active centres, and for specific functionating nerve cells of the same kind joined together under organ centres, or in the cord, and up to the final and *very lightly receptive cells* in the highest receptive passive cell-centres of the brain. For easy and practical reference, it may be recalled, that one principle, the primordial and progressively developing supersensitive norm and norm molecules

—plus the *law of excess* or accumulation—covers development.

Simple Reflex.—The old, static, single, immovable automatism could never instigate development, as it presupposes a single store of electricity, or other pneuma, or the old spirit power, or recently so many calories in each centre, and that could go on only for a certain length of time or life. But to give the origin of a combined *and proportional or recuperative* method for the nerve centres seems altogether newer and more helpful. And this frequently added mechanical strain alone gives the undoubted presence of added activity from time to time in the functional cell; and the nerve cell would not be there if it were not so.

As to Pflüger's other law of *Summation*, it may be real as regards the second or abnormal condition—electric transmission. And as it means a spread or overflow to neighbouring cell centres, it happens to very clearly support my nerve aggregation factor, and also partly the nerve cell sensitization; because it indicates, firstly a diminished, and then an increased or spreading *difference* of supply (electric potential in that case), and, *at varying times*, in the holding or energizing capacity of a nerve cell.

And as a further proof in this particular—and this

is useful in clinical diagnosis—a tetanized nerve cell area, or one from an extra irritated area, or from an inflamed or traumatic lesion in the brain, will react sooner than with other exhausted, or discharged, or dormant cells. So that, with such an irritated area, if connected with the skin through the vaso-motor nerve system, it will clinically react to an "exploding" local irritation. And such is the clinical explanation, according to Nerve Aggregation, of the *tache cérébrale* test.

My "SENSITIZING REFLEX" and "POUNDING REFLEX" will be similarly increased in inflammatory nerve centre conditions.

CHAPTER IV.

Nerve Centre Order of Development.

Another interesting nerve centre arrangement arising out of the relative and accumulative feature of nerve cell aggregation, is, that perhaps it will make it possible, if only to fix the importance of the phenomena of multiple aggregation of nerve impulse, to map out, or assist to map out, a consecutive nerve cell system of development in due order ; much after the schematic steps followed by the centres of ossification. This will not be entered into fully, except sufficiently to oppose the older view of simple reflex origin, and the wrongly supposed fixed or foundationally immobile nerve cells, for the well-known increasingly complicated development of the co-related nervous system throughout the Metazoa up to Man. This order would follow the proportional order of the likelihood of most developmental NERVE FORCE IRRITATION ; *and which probably gives the best insight into the cause of the complex Nerve centre developments.* It would be determined by the condition that the most usually and frequently energized nerve centres develop first in the medullary grove in front of the

notochord. The most frequently and first energized and developed centres would early form connexions with their muscle schemes, and some of the sensitive musculative centres would obviously be most frequently energized, and would belong to the First Order. This again contradicts the direct reflex. For the direct opposite effect, the least used and the most directly[1] energized nerve cells, as the *lightly energized* brain cell, would be in the first order if the direct and most central reflex sufficed. Subsequently, the later and ordinary autonomic centres will probably be found to repeat a closely approximate order in the embryos from the lowest to the highest vertebrates, and chiefly in the order of accumulative nerve aggregational increases. Between the two extreme orders, an Intermedial Order would contain the nerve centres presiding over organ and widely energized autonomic centres. With later Specialized Orders would come the specialized centres. And, then, those *with lessening receptivity* would appear, that is to say, with more easy energization, leading up to the order of the Highest Order of Centres. This gradual sequence and developmental scale of appearance of the nerve centres in the

[1] That reveals why the Brain (now highly developed) in Man acts first, predominantly, above the cord or muscle senses, and gives him control. It has placed him above the less developed animals.

embryo, whether in man or animals, would end with the most specialized nerve centres, and, as I consider, the most easily energized or holding centres; and at the top with the most widely and easily energized nerve centres, that of the brain (centres). The highest loquacious centres in man, or the vocal areas of animals, and finally the mental centres of the brain, would appear last, because they could only be used and energized on rarer occasions, and obtained only by long developmental use (as amongst the much used association fibres and analogous brain association fibres).

Clinically, the co-relative cells are most easily, and first, affected by poisons, as opium or acetanilid, or alcohol, and so the reception of the centres for pain and sense are altered. Again, clinically, there is a corresponding and practical obverse support and parallel in sleep, and in narcotism, where the reverse relative order holds good; speech, a light or easily gendered centre, being lulled first, and the coarse or more widely energized centres, as muscle control, vanishing last.[1]

When the hearing muscles tire down, that final lulling ends in sleep!

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[1] Muscle tone, easily produced, would be soon relaxed in repose leading to sleep. But hearing, as will later be referred to, depends integrantly on a specialized muscle control, and being widely energized, will be late to disappear. (*Vide* p. 81, Noise Limitations Section.)

CHAPTER V.

Exploding Centres.

Although the cord and other nerve centres are said to be self-initiatory or autonomous, their capacity for nerve aggregation disproves it: and the undoubted connexions show it is all plotted for aggregation, and which alone actuates them.

But whether the equally necessary distal exploding centres can be immediately differentiated for every nerve centre, would be too much to expect at this stage of our inquiry. Yet this will be the habitual association taken in the future. These mapped out exploding and last and distal points or "centres," either regular, or single, or combined, will be varieties of an associated impulse from a climax focus, and going straight to the nerve centre. The focal points will have to be mapped out habitually. In the case of the large centres, as the heart, there will be found to be regular exploding ganglia, and generally to be found within their own sensorial fields.

ON STRETCHED REFLEXES.

In the heart a *Stretched Reflex* may be found, in the natural way, in or near certain *Stretched Areas*, as the valves or septa or other connected structure liable to be stretched, as in the chordæ tendineæ. In micturition and with distension of the bladder, it is associated, in clinical experience, with the stretched trigone, and there exploding focal nerve cells exist. For defæcation, in the natural way, the exploding nerve cells will most likely lie around the anus and on the tender part of the *stretched* perineum[1], or both combined.[2]

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[1] A Stretching Reflex for the Perineum.

Defæcation consists of two parts not described in the text-books, and proves the composite character of the stimuli derived mostly from the perineal *Stretching Reflex*. After the immediate emptying of the middle rectum, after accumulated stretching reflexures, the final or extra ring stretching of the anal edge starts the Second Rhythm higher up, and ending in emptying the upper rectum.

Rarely, this may be followed by a Third Rhythm, descending the contents still higher up, by stimulating those cord and local centres.

In treatment in early cases of constipation, this specific effort should be accepted, with instructions not to hurry—or to use only the mildest means adopted to retain the sequence of those stages.

[2] This controverts the inhibition of the sphincter, which has appeared to me doubtful; and asserts the propulsive effort to overcome the convenient tonus of *all other sphincters as well*.

A CONCENTRIC SPACE.

For the ejaculation of the semen, I consider the exploding nerve cell focus, and partly an automatic centre too, exists at the end of the penis or urethra under the frænum, at the only stretched part, and at the *Concentric Space*[1] as it can now be called, and where the lines converge for that purpose. And the old view about the coronal nerves should be regarded as only supplying aggregational stimuli.[2] In the female the same nerve cells exist under the clitoris, and they are activated by the labia. In both cases walking, dancing, &c., helps to activate the centres. And after a month's irritation it helps to bring on the hitherto unexplained puzzle of the monthly or cyclical sexual sense, or the similar menstruation, together with the ordinary other known factors.[3]

OTHER NEW EXPLODING CENTRES.

Evacuation of the stomach proceeds from some final irritation, either indirectly or directly from a final exploding centre around the *stretched* pyloric gate.

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[1] *Vide* p. 59 (Note 1); also p. 109, *Pr. Lumbago*, and p. 104, Sympathetic Scheme.

[2] Pussep's mental regional effects would also be aggregational. Of course, a laboratory or an excess irritation, an electrode, would explode any centre.

[3] The HORMONES of the sexual glands probably nourish rather than stimulate.

For *Childbirth*, though requiring a much longer sensitization in the cord centres, yet the centre will receive its final exploding supersensitization for the uterus from the exploding nerve cells around the stretched os uteri, if one may judge clinically from natural birth, the tampon, and the other most significant factors. This stretching of the nerve endings must be one of the chief factors.

AN INFUNDIBULA REFLEX.

The rather widely energized Respiratory centre or centres can receive a considerable explosive accretion impulse from the nerve cells or exploding foci amongst the naturally and actively *stretched* infundibula,[1] the only part stretched in expiration. This all-important provision of the exploding nerve factor completes the linking up of the nerve accretion factor, under a Nerve Aggregating System.

A few more original clinical expositions will make

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[1] The residual air is more than an air lock, as now supposed. It also keeps up the pressure, and the slight squeeze of expiration will give the extra nerve climax pressure necessary to "aggregate the Respiratory Nerve Centre." After expiration, if this residual air be pressed by a slight blow on the ribs a rapid or increased inspiration occurs (with the mouth open, of course).

the practical bearing clearer. But it would be impossible to continue to refer to all possible clinical cases, *where it is of universal application*, and so each clinical case, and set of cyclical nerve functions, must be left more or less to the obvious latitude of individual insight and to the doctor's acumen of interpretation. The principle, rather than a string of tiring cases,[1] will be relied upon. It entirely depends upon the main features of each case. The main features will always guide, viz. :—

(1) Wide areas of nerve cell aggregation should be marked out and packed together for the nerve aggregating factor; (2) then any nerve impulse combinations, acting towards the central sensitization, should be traced to the origins and associated, and so that they activate the centre; (3) finally, the exploding centre or climax impulse should be determined upon, so as to complete the peripheral area of nerve impact accumulation, and which finally promotes the overflow or discharge of the nerve tank centre.

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[1] To quote thousands of cases of belly-ache or common dyspepsias chiefly belongs to the quack's advertisement!

The Heart.

Many simple physiological (*e.g.*, toning) and pathological (*e.g.*, arythmic) stimuli of the afferent nerve channels have for long been known to vary the heart's beats. But all these are invariably described on the old and single system of the direct nerve drive or reflex; and, all told, are merely momentary or regulatory in effect, and have comparatively little to do with Nerve Aggregation; and only just in the same way that a blister, clyster, or counter-action or referred pain were known to affect connected parts, through distal channels or areas, with their particular *single* isolated nervous influences. That does not alter the old view of the single regulated and single reflex *automatism* of the nerve centres. Nor does it interfere with this new view of Nerve Aggregation, but rather *supports the position of many distal connexions;* for even these secondary and regulatory end effects are sometimes themselves multiple in origin.[1]

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[1] It will be new to suggest, and as here shown, that irregular heart beats are not at all due to one arythmic centre, but in the later stages of Heart Disease, both organic and functional, and apart from lessened anatomical interference, should be attributed

The heart is too complicated an organ to yield to the present idea of a single reflex automatism. How could a regulatory centre work with the inferred balance, and itself physiologically undetermined? It is now supposed to beat through an accelerator or inhibitory automatic centre, but that would be actually unbalanced by both. There must be an intermediate, and primarily a more determinate way, and less susceptible to be upset by toning or other regulation. Yes, the best marked way is an accumulating rhythm, or rather an aggregating cycle, and which cannot easily be upset. And that rhythmic cycle, according to nerve accretion, has been shown to be complex and not single. So, taking the oxygen variation of the blood gases first, in part, together with the pressure of venous, and arterial, and high and then lowering tension responses in diastole, and the other anticipatory nerve factors, then the heart's nervous rhythmic cycle can be gradually energized and sensitized from the stage of systole to the period of diastole. And thus it is that the rhythm continues or fires at each

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to *excess aggregation* of irregular stimuli, as dilatation or *stretched* stimuli, or from constricted or irregular valves, or vegetation's and other pathologic stimuli, and other arythmic stimuli.

pulse beat ; and not the old reflex automatism, and certainly not the regulating centres nor the unprepared automatism, whether neurogenic or myogenic. Rather both together. Otherwise, the working of the heart scheme has never before been fully explained. Nerve Aggregation fully accounts for it, and includes all combinations, including the myogenic wave flow from auricle to ventricle. It would be better to regard the heart nerve centre as a combined centre, or at any rate aggregated by a combination of the present centres. The cord centres would be the important centres, and the second or myogenic centres would be equally organ centres, and not only muscle ganglia as at present held. There the outside or secondary regulating stimuli will alone be single (or sometimes multiple as explained before), and come from the surfaces (as in shock or operations), or from the tone, and heat, too, of the muscles, from the abdomen, or from the lungs, or from the pneumogastric in emotion, fright and other clinical conditions ; and these simply tone, or slightly or excessively increase, the action upon the accelerator or inhibitory centres ; some acting as merely extra and single influences.

But the whole and combined heart centre itself, *like the other great centres*, combine in greater

complexity than now supposed, and they act upon the principle of *nerve aggregation, plus* the exploding centre; and together they force the complete aggregation nerve factor, and force the heart into its cyclic beat. The first or primary and combined series of nerve stimuli come from the numerous peripheral impressions from all parts, from the spare muscle tone, and heat tone, and from the skin and thermic regulations, the vasomotor pressures, the motor stimuli, stimuli from around the heart, and from inside the heart, from the gathering flow of the blood within the heart itself, and in the arteries and veins, and through Remak's and Kronecker's ganglia, from the smooth blood wash over the valves, and the dilating or *stretched* auricles or ventricles, from the muscular movements of the heart and vessels, and the pressure and stretching of the nerves doubtless existing in the walls of the heart, and from the above-mentioned secondary regulating nerve influences, as well as the help of the respiratory, muscular, and mental impressions or influences. These act wholly or partially—and giving a relative scope—not easily upset—as the *constant priming* (not toning), and as the energizing nerve influences upon the combined cord and heart centres. When sufficient impulses

have accumulated in the cord and heart centres, the end feeders form a regular exploding centre—and which is a lesser gathered exploding focus within the heart, and probably situated near the *stretched* control of the valves or chordæ tendineæ and attached septa — finally sets the rhythmic cycle, or rather activates the nerve and muscle system of the myogenic roll or heart beat. Even in the laboratory or experimental states of isolated strips, and single stimulations, the contained tone, or transfusion, seral or saline irritation (which must accompany the strip), and the contained ganglia—or past or organ nerve centres—may supply sufficient energization to retain a mere rhythm, but only for a short time, for it always flickers out; that supports the aggregation system, for the normal and multiple stimuli are absent, and the heart strip soon stops.

As to the second or climax impulse, this internal heart climax centre impulse will usually itself require less accumulation than the great cord centres. Firstly, because it is constant; and, secondly, it is developed under slight and later localized conditions; and, thirdly, when the first stage of preparation is established, a slight stretching will be sufficient to discharge the roll or progression of the heart's contraction.

That is the reverse way to the ordinary explanation of any of the old kinds of *automatism;* and where the old electric inhibition through the pneumogastric nerve, or acceleration through the sympathetic nerves, are always only contributory, or accidentally regulating impulses.

CHAPTER VI.

Nerve Cyclic Centres.

"Autonomic Nerve Centre" has been a special term employed, here, as being less committal than that of automatic or *one reflex* centre. But a still more convenient and definite division into Nerve Cycle Centres will, now, always be better, and they will convey my meaning. Thus, the most actively developed, or *Immediate Nerve Cycle Centres*, will have a short period of nerve aggregation ; and they comprise the nerve centres of the brain, heart, digestion, deglutition, walking, co-related muscle acts, respiration, and other everyday conditions. Then, the mid or *Middle Nerve Cycle Centres* would be those of the functional centres of micturition, defæcation, and others having a medium length preparation. The more remote or *Long Nerve Cycle Centres*, and which require longer and more complete preparation and more widely-stored nerve aggregation, preside over gradually cumulative conditions, as pregnancy ; another instance is the before partly described

sexual complex or appetite. The recurrence of the sexual phase, or for procreation, has always puzzled physiologists. But the desires are not so much mental, as primarily prepared through a day to a month, or longer, by bodily movements, as walking, dancing, &c.,[1] and by a final or any impulse, as mental, or sensorial, or frequent irritation, or noise, &c., as the climax impulse. The long cyclic centres also include menstruation, and some of the delayed and longest developed mental faculties, and which, it may here be observed, as with long-moulded *character* and *experience*, have these psychical impressions created by the aggregationally extending impressions, or through the growth of the mental centres.

Immediate Nerve Cycle Centre.

1st Type: Respiration, and the Resuscitation of the Newly-born.

The non-oxygenated state of the respiratory centre, and the stimulated inspiratory or accessory fibres of the pneumogastric nerve, help to encourage the pulmonary combined centre into action ; of course,

[1] Gland Hormones would both develop and stimulate.

only as a part factor. If there were no preparation or predisposition to discharge, they or one direct reflex would not cause inspiration. The strong laboratory electric impulse does not count. Neither a vitalistic automatic power, nor a plain laboratory automatic working of the nerve centres has been acceded to here. The experiments generally adduced to prove automatism, and for localizing the centre, really leave all the important lower energizing sources from the phrenic, pneumogastric, and sympathetic and cord channels uncut, and so freely open through the cord. So they certainly do not actually exclude accretory nerve sensitization.

One reflex, the non-oxygenation of the respiratory centre, has been supposed to account for the chief exhibitory, and at other times the finally inhibitory regulation of respiration; and, if continued, in the newly-born, for the cessation of respiration. Taken singly that would be wholly contradictory. On the other hand, as wider nerve energization cannot be excluded, oxygenation will be only *one* of the diminished conditions of energization of the centre. And so failure must be due to the giving out of gradually one or more or of many sources of irritant impulses when respiration ceases in the newly-born;

not only CO_2 poisoning, but absence of oxygen occurs. More than that, the concurrent absence of many of these *external* stimuli at the relatively timed physiological sequence of events at birth, must have, *according to nerve aggregation*, the larger share of contributory influence. Moreover, the blood of the fœtus is already oxydized ; so that in the oxygenated stimulated state of the world the fœtus enters upon, this common oxygenating factor can only be a part answer for, and as only one spur to, respiration. If a single reflex had so easy a task to start respiration, it would be much easier to induce respiration in the newly-born or drowned, than it turns out to be. And even the oxygenating or bellows-method to supply oxygen has not been generally or satisfactorily adopted.

Now, what happens to the gathering respiratory centre at child-birth will be a wider nerve aggregation—a mechanical life-giving. And clinically, a whole series of energizing conditions present themselves, after the maternal, pre-natal, or previously oxygenated conditions. Of these, many may be mentioned as post-natal stimuli—the further contact impressions with the world, the slight fœtal blood flow, the commencement of the heart cycle-rhythm, the air and the surrounding states, changes of tem-

perature and light, and mechanical and body movements, peripheral impulses, and many organ activities, some more and some less, but they do form an aggregate reaction for the respiratory centre and activate it.

Treatment : A larger service opens up from this encouraging and useful view, for it will benefit the treatment of the clinical case of suspended animation. And, as a new practical departure, the newly-born, with suspended animation, requires the resuscitation of, not one, but many of these stimulations, for they are at a low ebb. So, as long as some of these remain, from the slight blood flow, or from the outward chills and air effects, so long, *and only during that period*, and what I may call the *inter-ergogenetic* period, can the child be resuscitated. It can be graphically, *i.e.*, merely momentarily, recapitulated, by saying that the child is gathered or flecked into life. Flecking alone, of course, explains nothing. Practically the only treatment under these conditions of suppressed life, at birth, or of the nearly drowned, would not be flecking alone, it will be that which can be favourably engendered and energized by immediately and artificially increasing ALL the possible stray and aggregating impulses around, and so as to increase the nerve aggregation, and to bring together sufficient quantity to explode

the centre into its quick or *short cyclical* (*i.e.*, extra sensitive) rhythm. In these cases, besides Sylvester's or any other method of artificial respiration, the aim should be not to limit the impulses or irritation to one kind, but *to practise as many as possible.* To that end, the cold and then hot douche heightens the blood pressure, and irritates widely, and accelerates the heart centre. Sylvester's or Schäfer's method, in my opinion, energizes the lungs through my new *Infundibula Reflex*, as well as the muscles, and has a good deal to do with firing the climax of the centre.[1] So, obviously, according to the above, a certain amount of stimulation should be practised before stretching this infundibula reflex by Sylvester's methods. And other additional means of irritation and stimulation can be chosen from a flash light in a dark room, from injections, irrigation, slapping, flecking, tickling the soles, renversement and other sentential aids, and electric excitation ; the main stress of the treatment

[1] Breur has showed as a single effect that lung *expansion* stimulates the sensory fibres of the vagus. This probably refers to the smaller bronchioles. But the Infundibula Reflex is different, and it acts at the other end of Breur's Inspiratory dilatation, at the end of Expiration, and it is due more to gradual *contraction* and continued pressure and *stretching* through those *infundibula climax centres.*

being laid on employing continued combinations and variations of nerve aggregating factors, together with the partly energizing Sylvester's Method. As an improved aid to the oxygenating stimulation, my method of nasal dilatation by holding the alæ nasi apart, or by my useful nasal dilator[1] will *considerably help* by increasing the pressure and the natural *oxygenating stimulation* both on the bronchioles and on the all important end exploding foci at the surfaces of the air tracks, and that is what I call the Infundibula Reflex, or exploding reflex.

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[1] With my Double Blades Nasal Dilator, natural or air oxygen can be increased over much longer periods, and with an aggregate greater supply, than by short gasps at irritating and artificial oxygen, and without awkward or expensive apparatus. To try sodium peroxide and the irritating oxylithe with water, a kettle and tube, or tube and bag, is all that is required, and cheaper than the unnecessary stock apparatus (and which, by the way, would be too cumbrous for a mountaineer or athlete. My Nasal Dilators would suit them).

Middle Nerve Cycle Centre.

2nd Type: Defæcation.

The recurrent act of defæcation proceeds from a mid-cyclical type of nervous accumulating centre. After each discharge it has to be primed by a corresponding whole day's gradual accumulation, and by increasing quantities of surrounding or distal stimuli. That quite negatives the vitalistic, involuntary, or single reflex. Many other of these activating stages may be readily recognized as contributing to the energizing of the centre.[1] They surround the general body activity and the continuous surface and body stimulations. (That system must not be lost sight of in the future, as helping to carry on the daily energy of the cord and brains of all animals

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[2] A centre of defæcation in the lumbar enlargement provides a natural development, and has arisen on a nerve aggregational basis from constant efforts at extrusion of the waste products of metabolism, from the highest to the lowest organism. A day's irritation travels from all parts of the alimentary canal; and sometimes alternating with congestion, irritation, or fears, or shocks from the ears, eyes, or taste; and exceptionally intensified by the nerve terminal irritations, catarrhal absorptions, or alimentary extensive irritations.

in the world generally.[1]) Again, in defæcation the most marked nerve aggregation factors will be the following: walking, especially the spurring of the psoas, the suction action of the abdominal muscles, the movements of the bowels themselves (irrespective of their own local centres), and many stimuli through the chain of sympathetic rectal and pelvic and even solar and other plexuses, and from the visceral ganglia, also through irritant food, the blood and lymph activities, and the periodical movements of the abdominal organs; and they act through the existence of intersectional nerve associations and cross-

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[1] As a *proof* of the necessary accumulation of nerve force in the discharge of a nerve centre, when a nerve centre is empty it is now known, and called, exhausted; but it really means that it is empty of nerve force. In that condition it will not respond to ordinary stimuli. If the mind be sufficiently exhausted sleep will ensue. But when a centre like the defæcation centre becomes sufficiently primed by a fair amount of irritation force, *as when nearing the time of its cyclical function*, a slight extra stimulus will activate it. This can be practically shown in constipation or in defæcation. A flicking on the colon area, massage, or a mild battery applied to the loin will all relieve or determine the flow or discharge of the centre and move a motion or over flatus. If the centre be empty, or exhausted, or spoilt, no effect can result, and the lack of sufficient filling stimuli will cause cessation of discharge and constipation.

paths in the cord. These all activate and keep the cord centres constantly trimmed up and sensitized. The final, or exploding, local stimulus will be from either the chief cyclical exploding or stretched area around the anus and tender perineum, by pressure and stretching, partly by helping a rectal and colon reflex as explained, and partly by a cerebral discharge; or at other times mostly by an irregular exaggeration of the usual cyclical stimuli under an irritant purgative. Of course this entirely does away with the negative view of a defæcation centre and the consequent inhibition or relaxation of the sphincters, either of the anus or elsewhere. It substitutes a plenary or accumulative nerve aggregation. The sphincters will then simply be forced against tonic activity higher up.

In *treatment* the aim resolves itself into an additional aid or nerve aggregation. In the early stages of constipation, mild adjuvants to the recurring stimuli will suffice; for example, this is the explanation of most of the cures of the constipation of sedentary life, by increased exercise, and other mild balneological means (*not measures*[1]).

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[1] Measures, as a word, is a constantly ill-applied term. It should apply to a new, good, and complete measuring of *all* and not tiny parts of a whole subject; and with all the details complete and measured.

Practical Points referred to and supporting the Nerve Aggregation factor.

(1) Strong cathartics or too strong stimuli only exhaust the centre, and lead to an undesirable slow recovery of the centre, and should be avoided; smaller repeated doses being preferred.

(2) In the earlier cases of constipation the addition of brain or thought impulses, as looking forward to the hour at night or in the morning, will hasten or activate the centre.

(3) Hypnotic suggestion[1] can be explained by this system, and it amounts to the same "*willing*" *or a brain tapping augmentation stimuli* by the operant; but it has to be repeated much more often than by *auto-suggestion*, and the cells of the brain must be made willing to accept the suggestion.

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[1] In hypnotism, the redundancy of impressions act upon a willing or an apathetic state, and establish or re-establish the mental channel and nerve fibre course. It inevitably leads the thought in one direction, especially during a trance, and not to be screened off or diverted by the ordinary minor efforts of will power. They have free access to modulate or discharge those centres of thought or action morally (or normally) traversing those particular nerve lines of the brain. All such constancy of nerve relays, or total summation of nerve pressure impressions, constitute nerve aggregation. No other mechanical working doctrine fits hypnotism so well.

(4) So in ordinary treatment the *auto-suggestion, self-hypnotic method*, as here indicated, is cheaper and more determinate.

(5) If the centre remain young and undamaged, the therapeutical increase of the impulses by anticipation of the clock time, in the evening or afternoon, and afterwards through a longer day's cycle to the next regular or morning period, will establish the ordinary matutinal regularity again, and will re-establish all *the ordinary or minimal collecting impulses.*

(6) It also explains the aggregational impulse, and consequently discharging use in constipation of irritant cups of coffee, pipes of tobacco, doubled or bulky breakfasts. I also think it explains *determined will*, the use of glasses of spa, cold or hot water, baths, towel friction, massage, and numerous encouraging strains in what may now be called the *nerve aggregational treatment* for constipation.

(7) As a mild aid, playing at a game or some hand ball game at the time, will be useful.

(8) And nose-blowing to provoke a discharging flow is a direct proof of what I call the *Perineal Climax Focus and Reflex* stimulation.

Long Nerve Cycle Centres.

As far as man may judge, the old controversy and disagreement about sea-sickness disappears if it be attributed to the system of pathological, or an inimical quantity of, nerve aggregation. As an accumulative process it connects up the upsetting impulses, and converges *all of them* at the only one possible and connective excess centre; and these channels meet in the deglutition and vomiting area in the medullary centres. They arrive from the intricate cyclical relations, with the moving stomach and viscera, from the disturbed eyesights, from the irregular catchy breathing, itself a proof of cœliac axis derivation, and diaphragmatic movements, from very uncomfortable sensoria, and largely added to by the unrest of the brain. In fact, all these impulses lead to and *congregate alone in excess in that one centre*, and which happens to be the associated vomiting centre.[1] The series of constant or irregular

[1] SNEEZING, too, does not occur at once, as it would do if due to a single reflex, the impressions, like the eye looking at the solar rays, tap on the retina; but it takes more blinking and then repetition of the sun ray tapping, or its mechanical force, to discharge the rimaglottis and diaphragm, and explode into a sneeze or a cough.

impressions, and the exaggerated gyration impulses from the semi-circular canals, and with the awful up and down motion of the smallest boat, the impossibility of keeping the stomach still, originally upset the muscular rhythm, and then the centre, until, *through much nerve overflow*, vomiting occurs.

The suspension inventions do not get over all of these. It is best appeased when more or less control happens to be exercised over the nerve discharges, and causes the abnormal aggregation to cease, or when the muscles chiefly concerned have become accustomed to counteract the motion of the ship.

For treatment, the practical application to nerve aggregation should be sleep and sedatives, and other adopted methods should aim essentially to help to counteract the aggregative nerve centre impulses to the vomiting centre. Counter irritation and drowsiness from alcohol may be good at first, but not afterwards. Opium, bromides, chloral, and chlorotone, and many other nerve sedatives blunt the nerve channels.

Other Intermediate and Long Cycle Nerve Centres will be the sexual complex,[1] childbirth, and menstruation.

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[1] In Childbirth, Catamenia, or the Sexual Complex, whether under sympathetic, or cerebro-spinal control, or the autonomic penile centre at the most active part of the frenal

Besides accumulative irritation of the ovaries, all activity, and uterine and organ activity during the puerperium all prepare the centres of expulsion.

The long cycle nerve centres require longer, continuous, and intermitted series of impulses, or wider distributed circumstances, to prepare their tardy nerve aggregations, and so as to promote the ultimate activation.

The same system covers every other variety of composite nerve reflexure.

3rd Type: Thought or Brain Centres.

The single, or central, or unknown inspirational origin of brain thought[1] is still encouraged, or rather

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junction (vide diagram, p. 104, Lumbago Pt., and p. 37 preceding), a simple immediate reflex in no way accounts for the periodical manifestation and occurrence. The prodromal or nerve tank aggregational commissions can alone render the complicated discharges possible. As to the sensoric accumulations, the lumbar enlargement has very wide channels of nerve approaches, besides those from the internal, external, ovarian growth, and daily irritations. And after varying periods, the catamenia and other functions discharge because of being sufficiently prepared. Even the decidual shedding discharges after preparatory inflammation, and surface changes, local tension, hormone action, and the cleansing factors, all help to collect in the nerve tank centre gradually.

[1] Most wordy philosophers hold to, and expand upon, the

encumbered by the selfish feeling of the sovereign ego, or by the ecstatic and unknowable, or by the ethereal, spiritual, or half-demonstrative electric laboratory conversions. Of course, spiritual subjections to the senses, like the belief in Priest-riding, have vanished. Unconscious cerebration and sub-conscious ego too, have only been half answered on their intangible basis of unreality ; *for the workings of the brain grow and grow regularly.*

HERE it will be well to take one step further, and

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immaterial quality of thought. Yet, it must be brutally insisted upon as being material—and, still, how little we know of the nerve cell, or even of any of the fancy named cell albumens, or of colloids, zoogene, and lipoid filter membranes.

Chemical elements differ not only in ordinary atomic quantity—but also in molecular material structure. The latter all vary in fixed tenacity—some being rendered less active than others. And the molecular material of the albumen and proteins seem to be amongst the most rarefied and minutely active. Yet the structure of life resides and consists in that. For example, the minutest part of an anaphylactic protein—or any ferment too—must be very loose in molecular material, for it combines in the most diversified way with the corresponding "combine base" of the Host's serum albumens. [Antigens or complement are too much unknown to use as definite terms for my meaning of the combining bodies.] But all cell changes have these chemical adjustments at base; and even the brain cell has to work with similar exchanges. But from those exchanges they free dynamic and pressure force.

to refine it down prosaically to a simpler ergogenetic equivalent, and at least to venture upon the technical commencement on these lines of thought organization and mechanical origination. We can only state the *results* of thoughts with certainty, but the results will only continue to mean chaos if the known origins be not organized. And this will now be done, not only by the aid of clinical deduction, but from the results of thoughts, or thought origins, the only available certainty to proceed upon. And it can be quite clearly shown, nerve aggregation performs the office of organizing the origins of all mental phenomena. In no other way can the basis be found, and so clearly taken from the known accumulative evolvement of *brain training*—of course not the later mental *experience.*

That lays the foundation of mechanical thought too—a great desideratum. Thus, word cell centres, or phrase cell centres, will each have, as explained, a regular and constant connexion with co-related groups of cells; and each, in turn, will be in communication with motor, visual, and auditory brain areas; just as in the pathological aphasias (or mental apraxia) the visual, speech, motor, and auditory centres and their path relations (fancy names and blinding equivalents like "cheiro-kinesthetic" left out), have been

sufficiently and experimentally demonstrated; whilst writing and speech *sensory* cells are now definitely associated with the cortical motor and sensory centres (Horsley). *That is, there will be definite sets of cell relations for single or elaborate thoughts.* Each group of cells will be widely energized from each other group, and from external groups. But each thought cell, or word centre group, will only be finally exploded by an associated climax impulse, as by a suggestion, or smell, or eyesight, or auditory, spoken, or other sensorial impression—being always a *mechanical impression* (*i.e.*, cellular, contractile, or cellular active). In the infant, their signs and their wonders—or other word-received impulses at an older age—will lead to muscle actions, and much before the longer practised mimicry (*training*) of set thought, and set words, and set exercises of muscles begin. In adults, thoughts and words, written, seen, or spoken, according to sequential aggregation, will gradually be trained up to a fixed sequence along each nerve cell and nerve line of thought—but always mechanically fixed from stage cell to stage cell—and therefore *no thought can be produced beyond the probable aggregational cause:* it must belong to co-related, developed, and educated phrases. As each word and each phrase

is fixed from an impulse, in turn it fires the next series in practised order: and therefore *a probable cause of sequence* maintains the wonderful order in the brain. I have elsewhere declared that relative development is always sequential, and here it can be traced (*v.* Vol. I).

The greatest orator, within the assorted variety of his trained vocabulary connexions, would eventually have to, and frequently does, repeat himself, so restricted, and not unlimited, must be the cell groups sequentially arranged and used. The Arab sages this impart: "*The Tongue's great store-house is the heart.*" I like the poet's forethought; I have tried to show that it involves a wider range than that referring to a single impress in Broca's convolution.[1]

In a long speech the words will be invoked by recurrent suggestive excitations from the periphery, from the basal ganglia, other word and sensorial centres, from the surroundings of the speaker, and from the pointed vehemence of gesticulation and visualization;

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[1] Another and Practical Application may be stated. So mechanical is the Brain (or Thought) that, I consider, Strong Thought (*i.e.*, outside stimuli) will lead to habitual dilatation of the brain vessels, and so prevent anæmia and fainting, or sometimes proceeding from the change from recumbent to erect positions:—So, to order a strong determination will often counteract fainting, even where slightly degenerate arteries interfere.

and all contrive to impel not necessarily a *flux de bouche*, but an incessant series of interwoven, energizing stimulations, and ending in the discharge of sequential thought lines. And they must be fairly habitual and accepted to conform to sense—even like bird or monkey noises are sense to them.

It is notorious that the shortest habituated words will run a thought line. Personally, "and" easily runs to the catch phrase "it was and I said not or"; and where the comma ought to be placed after "and" and the word "said." A dozen pieces of memorizing then occur to one. Or the thought of "a frog" runs on into the nonsense rhyme: "There was a frog lived in a well, With a ring-tum-bully-bully-Kino"; "Kiminaro Kiltikaro, Kiminaro Kino," &c. Again, with trained dexterity in music, one player plays from memory, the other from the visual book, but each of them from note cell to note cell. Each concurrent stimulation, whether contractile or not, follows from one worn path cell to the next, *and working instanter on the prepared chemical groundwork of an irritated or aggregated nerve-cell matrix.*

Well-stored ideation, no doubt, requires training, too; and, once learned mentally, can lead to more or less practised genius; with more tendency, there,

to extravagant overflow to new cells beyond the set path. Therefore, the old idea of the heredity of Genius is barred.[1] It must develop subsequently by training or bent of way.

Again, it fits the following: Wayward, uncontrolled, or overflow connexions amongst the thought cells—just like cutting off some cells by "opium" or "sleep"—may be dangerous until practised; there, thoughts cannot run from cell to cell, and therefore they will so far be wayward and bizarre.

Recitation comes easier by repetition or aggregation; but alcohol poisons some of the association fibres and may entirely stop the "run." But, as a rule, in health we practise control or exercise the cell connexions under guidance: "Give thy thoughts no tongue nor any unproportioned thought his act." Superlative Shakespeare showed how easy it was to canter wrongly without association or guidance.

The length of practised thought and associations are, it should now be noticed, low in savages, and longer and easier in highly strung, nervous, and cultivated people's brains. *Does this not explain and*

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[1] See Advance Section, p. 196

support the argument that exercise predominantly, as I think, determines the foundation of the child's language; or of any mental development, from the unused, unexperienced, and unsensitized word cells; from the muling and mumbling, gradually right up to the greater power so widely exercised by the trained thought cells and brain run of the cells together in manhood.

If this mechanical or cell view of sanity be accepted, and taken as a submission to the brain "run," or of the forms of custom, the habit of sanity, apart from a thousand alternative aspects or variations, may be closely accounted for on the basis of co-relation of the practised brain cells, together with a fair number of customary "autonomic" thought centres. Whilst insanity, apart from a thousand ever altering classifications, will be marked by instability, lost power of attention, ungoverned and irregularly checked cell overflows; and, from the unlikelihood of cause and use, the insanity overflows into much ungoverned, unrestrained, and improbable cellular causes of action. So insanity depends much upon damage to, or overflow of wrong directions amongst the inter or associated fibres and between the brain

cells.[1] Hence the disturbed and improbable sequences in insanity, and so characteristically ending in, or passing over into, other or unaccustomed cells, and therefore along channels of ill-oriented emotions, fanciful annoyances, hallucinations, or dreams, or into other disorders.

Galvanic Therapeusis.

It may be mentioned, here, how this system alone explains the improvements under Galvanic or Electric treatment of damaged nerve channels. It improves the primary condition of the tank accumulations of impulses. It heightens the ease and flexibility of ordinary working discharges. That is a more definite explanation than improvement of nutrition.

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[1] As Causes: Alcohol has been cited, but damage may arise from diseases, poisons, inflammation, nerve strain.

CHAPTER VII.

SLEEP.[1]

DURING the brain's cyclical exhaustion at night, and during the succumbence of sleep, the outside impressions have a poor energizing power, and the cells (not the vessels) go into sub-dilatation (and with some sub-contractile recession of processes, according to Ramon y Cajal) until recovery. That correspondingly would lessen activity and so exercise contraction on the vessels, and explains the anæmia phenomenon. Sleep also aids rest, and corresponding chemical repair, allowing slower and unstimulated action, and this abeyance of action discharges any excess of aggregational strain in the brain centres.

As a proof of the nerve tank phenomenon, it

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[1] The ordinary expressions about the obvious, but meaningless and unconnected Katabolisis and synopsis in sleep, or a subsequent rest of vessels and anæmia in the brain, and probably simply due to non-activity of the brain, of course do not cause sleep; nor do they explain anything whatsoever.

may be submitted here, that in sleep, where aggregation is discharged from the brain nerve centres, the centres cannot work: the brain is in abeyance or sleep.

In repose, or with this practised cycle of sleep, and just on a level with a cyclical law of activity in every cell of the body, few impulses arrive at the thought centres, and so more time will be permitted for the cell's *amœboid nuclei* or the whole cell's protoplasms to conform to their "habitat," or their recuperative state, and for their internal chemical readjustments, receptivity, and nuclear, functional, and contractile recovery. Altogether, Sleep composes a *benefit circle.*

The lack of a good deal of customary aggregation (stimulating chiefly) answers for the whole cause, particularly for the gradual causes of rest and sleep; and, further afield, for the non-activated state and dilated state of all the body cells.

If there were only the suppression of a *single reflex* to operate, and not aggregation, then each co-relation and stimulus would almost inhibit any sleep, and prohibit any rest whatever for the other cells of the body cycle; and in sleep even a single snore or a rumble on the road would then awaken if sleep

were dependent on the single reflex cell cycle. But it rarely does so, unless loud enough, like the laboratory and artificial gong-trial, and able only artificially (by piercing the ear muscle reserve) to replace the real and natural aggregation factor.

Clinically, to provide sleep experience shows that there must be some control over the hearing, which otherwise energizes the brain cells ever regularly, and ever so widely; and the control climax for that would be the habituated attitude of repose; and, of course, the ear muscles will participate. That repose extends to a dulling of hearing, probably by a relaxation, with the other muscles of the body, of the internal muscles of the ear—as well as the eyes. The practised act—Repose itself—actually induces what we generally term the composing to sleep; and also first sets in motion the muscle drop or damping of hearing sounds, and which plays this initial, new, and most important *rôle* (*vide infra*).

NEURASTHENIA.—With a long want of rest in the higher receptive brain cells, and late hours perhaps added, and often arising from much vexatious *noise nuisances* by thoughtless or coarse individuals, an aggregated or marked supersensitization of the implicated cells supervenes. This surplus nerve stream

overflows to all the other associated brain cells, and they in their turn become tired out. That abnormal aggregation, and *aggravation*, of other brain cells and centres gives the best clinical picture, *founded on the pathological excess of Nerve Aggregation*, of the varying degrees of neurasthenia—from hysteria, up to acute and chronic prostration, or insanity, and to mania and death itself.

As a support to this view of neurasthenia, the young have few association processes, or developed brain cells, and consequently they do not possess the same capacity for overflow supersensitization. They correspondingly very rarely suffer from neurasthenia, or trouble much about noises. Idiots and phlegmatics unimpressionably can bask in noise in the same way. And as a practical application for any preparative treatment of neurasthenia, it indicates the importance of *building up a dull resistance* by quietude, and by food superabundance, and it explains the equally important rest of ideas on the old Weir Mitchell plan. But there is still the more essential necessity of inducing *aggregational rest by sleep*, with or without the aid of narcotics. It also fully and best explains the use of all narcotics in all oversensitized states of brain affections, in hysteria, neurasthenia, irritation,

brain diseases, alcoholism, and the more remote irritant nervous effects of rheumatism and chorea.

Awakening.—At the end of sleep, with the well-worn arrival of the rosy-tipped morn, when

> "The herald lark
> Left his ground nest, high towering to descry
> The morn's approach, to greet her with his song."
> —*Milton.*

And with the ill-trained, and, as yet, the unimproved noisy breed of chanticleers—(*which might be bred not to crow*)—the usual and really very narrow inspirations of the business day of the ordinary man commence. The nerve and other cells of the body are then sensitized in serried order, by the light of the day, the widening strains of unknown but penetrating rays, and very considerably by the sordid legal licence of abounding *noisy nuisances*, worse by day even than by night, and his daily trials, and many other gradually energizing internal and external aggregational conditions. These by accumulative action, and *not by one reflex*, and which is the important error to avoid, fan or press sleep into its awakening.

An important feature of this mode of transition of sleep to awakening will be explained upon this

principle, and it refers to the *annual or seasonal incidence* and length of sleep. The varying length of the nerve aggregational sleep cycle must tend to be prolonged in winter: because of the less lengthened aggregations of the short days—and certainly not due to "instinct" or "composing," which mean nothing. And this seasonable sleep is shortened in the summer: because of the earlier daylight, and with its other correspondingly greater external bustle.

In treatment, too, the proper use of this system will therapeutically extend the ordinary lulling of drugs, by supporting and emphasizing the impressive need of adding *quietude from external impressions* for sleep to be induced.

The blind and deaf, of course, vary the influence towards "repose," or sleep, according to their own sensitizing areas. Their own gradually lost sensitizing areas being the basis of sleep origin; and it must in their cases fit this cyclic function of sleep on the basis of aggregation. It explains also why children, and other less energized, peasantry sleep more.

Irregular and pathological wakefulness may mostly be attributed to extreme sensitiveness of cell prepara-

tion, or to some increased "preparation," or to easier or awakening aggregation of impulses from abnormal directions. In the nerve irritation of cardiac cases especially, sleeplessness should be attributed largely to the accompanying increased blood stretching, the fulness, the discomfort, and fear, all acting as excess Nerve Aggregations. With the deaf or dumb, those Nerve Aggregations exert the same influence on their increased sensitiveness through their own particular and heightened sensoria. In the usual thousand cases of dyspepsia, too, insomnia may be traced to this newer Aggregational factor, developed by the increased stomach impulses and abnormal dilatation sense, &c.

As to the awakened joy and refreshment of the subsequent day's human tasks of life, and the business of pure selfishness, and other lazy business transactions, it is as common to the savage as to civilized man ; and let it be always remembered, each phrase or action is accomplished on the same lines of direct co-relation and association of each trained thought line in the thought centres from brain cell to brain cell.

Noise Limitations.

Everyday and night noises, as they have enormously increased amidst our thickening civilization, and in face of *the mad absence of the slightest statutory control* over noises, these must be a very distressful imposition to many people; and not lightly to be dismissed on the idle jester's whim of merely noise teasing, or the idiotic notion of "fads," when very few people have fads, or for the sake of sporting fanciers of beast, dog, or bird loving and sanctioning Acts, or for the trivial love of farm pets, or for other painfully insular prejudices—all of a low level, cunning, or to suit the thick-headed Councillors, and the muddle ideas of voters for town bands and hurdy-gurdys, and the usual mass of contemptibly spoilt and copied machined music and machine row, so meanly common as experience goes. The danger of this pain is a commanding question. This excess of noises by neighbours, and in the street, causes a depth of pain and weariness, suffering, and fatigue (excluding the coarse and unimpressionable) to the very pick and power of the best working finesse, and amongst the brain workers, and whose more sensitive natures react more readily to Nerve Aggregation. The law wilfully ignores, at its

ease, the unmerciful damage and mischief wrought by noise nuisances. And it seems to me absurd to ignore the best and most conscientious workers, and those most nervous, when it blamefully protects all the unlicensed noise nuisances during the day and night, and those exhausting and routine trivialities and extra noises,—so easily curtailed,—simply for the indulgence of the lower workers, navvies, pedlars, low motor car drivers, and especially of noisy cads (who care for nothing but purse show), and hoydens. Even Liberalism means "live and let live," and certainly not to exalt the licence of the lower class (non-mental) workers, to expedite the extinction of the more nervous upper (or more responsible) classes. This hideous noise licence also works most injuriously on those who suffer from the absence constitutionally of some power to counteract the accompanying *nerve aggregation factor*, and which, when in excess, does the irreparable harm.[1] Still, there ought to be limiting legislation for the excessively noisy overgrowth of civilization—but not by driblets, for motor horns, or street music, or dog barking—but by a general

[1] It partly depends on the laxity of the ossicular muscles of the ear; *ut infra*.

Noise Abatement Act wherever a noise (other than accidental) becomes a Noise Nuisance, as formulated in my book, "Medical Reform Measures."[1]

From this overflow of noise sensitization the brain cells very easily fall into a surcharged state of neurasthenia or unstable breakdown, and with it must come commissural interruptions between the cells, and therefore *the non-possibility of the want of control and application to the ordinary mechanical paths of the cell groups regularly occupied in the day's business affairs.*

With regard to Nerve Aggregation, this noise and

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[1] The continuance of the present *bureaucratic* oppression and sullen insolence of the sinecures and highly paid departments of Government, and as a system favouring the neglect of public appeal, has become intolerable and untenable. If a wealthy philanthropist would pay for a Public Corrective Movement—I could point a way to influence a fairer hearing. (I communicated this to the *Times*, but as usual, and with their political smudge, it was denied a discussion.) Since my own appeals for Noise Nuisance Legislation, a President of the Royal College of Surgeons has lately, with others, issued a series of impelling, eloquent, and imposing appeals, beyond those my poor pen can attempt; and the breath of their honest intensity has been cast to the Winds of Dispersion! Both kinds of Government seem only engaged, with their offices, intent on the dispersal and not the construction of Wealth both in specie and intellect.

excess aggregation very strongly supports habitual sensitization. For if there were no truth in this *thesis of nerve aggregation*, and the accompanying sensitization, then the brain cells of many people *must have constantly been disorganized or killed long ago;* instead of exhibiting an observed and usually benign toleration to a certain amount of accustomed mulplication of impressions, and the habitually encountered immunity to a fair quantity of the aggregate worries and noises of life.

Rather rarely, and if kept *short of exhaustion*, noise strain, with some exceptional people, helps the energization of the brain and stimulates it—much as the quietness of green fields stirs the pastoral poet. Many writers, like Sterne and Pope, were stimulated by the exuberant excitement and noisy turmoil of London life. Luther, also, was at his best amongst the noise of disquisitions. Burns throve amidst the inspirations of a carouse. And lethargic Dr. Johnson was wittiest at the noisy and reeking tavern.

Treatment.—Short of these advocated Laws of Abatement of Noise Nuisances, some mechanical protection has sometimes and conveniently to be found. The Tragus Truss (described later, *vide* Contents)

certainly modifies the entrance of noise sounds to the ear; and it should be worn intermittently to avoid circulatory and any discomforts from constant pressure.

The object of mentioning it again is to dwell on the *rationale* of the Tragus Truss action. And it has also another interesting bearing, for it explains a reference formerly made that it checks the internal, rather than the external, conducting apparatus for auditory sounds, and depends upon this for its effectiveness. This is an important new point. Internally to the middle ear the endoliths and endolymph are considerably disturbed beyond the normal by any excessive and uncustomary noises, whilst the filaments of the nerve hair cells of Corti's body will equally and correspondingly be waved beyond their proper amplitudes, and which will give stronger and stronger impressions to the nerve aggregational and co-relative unison of the brain centre's cells. As the cortical and super-sensitized auditory nerve-cell centres suffer and break down from the outgoing charges, they must scatter and tire the surrounding noise-bombarded nerve-cells; so it seems that a *regulating function* can be well ascribed to the initial contact apparatus, namely, the internal muscles of the ear—that is, it is due to a subsequent and muscular

development of control over external and extra noises. And this function occupies the ossicular muscles in the maintenance of *a customary balance capable of modifying or stopping any ordinary excess or injurious amounts of sound vibrations*, besides and beyond the known adjustment for sound catching of the ossicles by the Tensor Tympani (Hansen). A similar development, and habitual preparation, to modify any customary series of sounds may equally belong, but to a less extent, to Dechemet's muscular membrane, and to the Fenestra to a still less degree. If that be true—and most muscles respond and are often regulated by these extra amounts of nerve aggregation—it will account for the tolerable comfort that leads in the case of the exhausted ear muscles, after the exhausting exposure to noise strains, to a quick recuperation for those who care to wear the Tragus Ear Truss.

It indicates how it helps to rest the small ear muscles, again accustoming them to noise sounds; and permitting of their gradually improved strength, with recuperation to their normal nutritional molecular and improved nerve-cell tone, and to a subsequent and tolerant resistance to any further damage from the sensitizing auditory nerves of origin; and

altogether it relieves the central auditory nerve-cells from outward charges from the aggressional and complex sensorial relations.

That completes my introduction to NERVE AGGREGATION as one of the factors in physiological and pathological nerve conditions of origin and transmission; and the naming of some of the regular end or exploding foci. Many new views have been guardedly expressed, and a lengthy series of otherwise typical difficulties have not been shirked but explained by this *synactic system.*

It has been shown, that Nerve Aggregation gathers stimuli from far and wide and brings them to a focus; and, with the aid of a final climax stimulus, aggregates sufficient energy, or *molecular and unstable cellular activity*, to start any transmission from the nerve-cell or from the centres, onward and forward on their reflex arc; and producing an impetus or nervous orbit of a mechanical or physical, and not the more often supposed but less naturally electrical, strain and passage.

COMMANDING APPLICATIONS.

FOR A SURGEON :—Less the number and length of wound incisions, less will be the increase of traumatic Nerve Aggregation. *It accounts for shoek or nervous drain.*

FOR A FUTURE MINISTER OF HEALTH :—Quiet and Rest, or the want of it, predicates, or nullifies, all the personal work of Hygiene.

• BEING THE PRIME KEY :—The First Law of Hygiene is Rest without Noise disturbance.

Lumbago and Neuralgia.

NEURO-LUMBAGO.

ON THE NEW BASIS

OF

NERVE AGGREGATION.

NEURO-LUMBAGO

A NERVE AGGREGATIONAL DISEASE.

INTRODUCTION.

THE onset of lumbago has been attributed to various causes that have had to be shifted or abandoned from time to time. The thought here will be to harmonize the old data upon the new basis, giving it a broader outlook, and submit more appropriate clinical tests, whilst retaining the positive associations and clinical order ; indeed, the older divergencies and discrepancies require this readjustment.

The cream of the traditions of the text-books attributes lumbago to rheumatic gout, or to gout, or to rheumatism. That was apparently arrived at because it happened to be the disease in the past which predominated as the popular disease. Another ground for that guess may have been because rheumatism or gout was protean, and had as wide a base as any other for any unknown attack.

Sydenham, our greatest clinician, two hundred and fifty years ago, said that Medicine was an art of observation. It suited him, as it did Hunter and others, for many a long day. Yet Medicine, if tempered with elaboration and deduction, and treated as a science, must lead and extend far beyond mere observation. And treated thus, the only feature that stands out from the above capricious categories of the old watchers, centres lumbago in the general, *and not too local*, pain in the back or lumbar quadrangle. No doubt rheumatism as a mere fact, and blended with a hundred other facts, may be noted; but, more important, the influence and inference of its existence or non-existence must lead ever so much farther, as shall be shown. And even if all the parts be bathed in the poisons of rheumatism, or with urated blood, it need not, and does not, bring on Lumbago at all. Another and more embracing communication or *general factor* must be found.

Amongst the older authorities Inman learnedly treated of Lumbago as a myalgia, and regarded the muscles as mainly at fault. Moderns have re-discovered that idea. Player, Brown, Darnall, Teale, and Griffen favoured the cause of subacute inflammation of the posterior roots of the spinal cord. Other visions have

attributed Lumbago to rheumatism of the bones, as of the vertebræ, or of the tendons, or to joint rheumatism. The latest knowledge, and that now mostly favoured by neurologists, taxes Lumbago as a myositis and fibrositis, probably of gouty origin, or according to Gowers to rheumatic inflammation. The curious feature about this particular exactness and precision is, that these muscles and tendons or points are never named. And the impossibility of moving rheumatically inflamed muscles negatives such a condition. Pressure treatment or binding in lumbago actually relieves, and occasionally considerably ; and a nerve trunk carrying any aura may be relieved or stopped by constriction and pressure. But pressure does not relieve, and only increases, the pains of a swollen and tender muscle. Indeed, acute rheumatism of the lumbar muscles hardly ever occurs. In these supposed cases of lumbar fascia rheumatism (*i.e.*, Lumbago) neither the joints nor the heart respond as they should do. Neither do the muscles enlarge nor become œdematous ; and the temperature does not rise as in rheumatism or gout. Nor does such an attack of rheumatism fit the features and chronic extension of what Lumbago consists of.

In an examination of these points extending over five years in the full Reports of a large London Hospital (*a*), and over two years at another chief London Hospital (*b*), Lumbago could not be traced in connection with gouty or rheumatic conditions. Pathological materials, too, were searched for in Gout and Rheumatism with the object of tracing the incidence of Lumbago, and such record could not be found. In likely rheumatic or gouty attacks, as myelitis, fibrosis, gouty neuritis, rigidities, and the loss of power over the reflexes, besides the main diseases, like arthritis, or rheumatoid arthritis, these never extended to Lumbago. The exceptionally few and fatal cases of rheumatic meningitis, poliomyelitis, encephalitis with hæmorrhages, or gouty pleurisy, neuritis and myelitis were also closely examined, but they were never connected with Lumbago as they ought to have been if this was such a definite cause. Again, rheumatic attacks and even fatal cardiac and dropsical cases were not reported as connected with any histories of Lumbago.

That condensed but sufficiently extracted and special survey need not be considered exhaustive; it may not exclude the rarest exceptions; but it does prove a full sample over wide fields and that

cannot be gainsaid, nor be at fault. And general experience, during my inquiries, has been that the old hypothesis, in spite of the respected authorities, can bring out no rigid rule for any dominance of rheumatism or gout as the causation of Lumbago. In Lumbago, therefore, just as a coincidental conjugation, the most that could be claimed for Gout and Rheumatism is that they may possibly exist in association, but they do not form the underlying cause of an attack of Lumbago.

NEURO-LUMBAGO DUE TO NERVE AGGREGATION.

To explain Lumbago, and fine it down to a fixed entity or end cause, it will be necessary to regard it as a Neuro-Lumbago, and due to an accumulative nerve reflexure; coming under the heading of Nerve Aggregation as previously explained. It links up many of the supposed divergent and different facts associated with the attack of Lumbago, and each forming part of the proportional nerve aggregation, and acting with a spice of, or in truce with, some or many of the older clinicians' stock and that ought now only to be taken as part of the more prominent parcel.

The new cause of Neuro-Lumbago, taken as due to the nerve aggregational process, depends upon the position of the lumbar and other dorsal nerves and the peculiar facility for, and their extraordinary exposure to, the priming factor of this system. In the cord, as one knows, the nuclei mostly occur and work in sections, and the suggested accumulation of nerve action diffuses the pains over the lumbar nerve

centres, and bursts out as an associated and characteristic aura, with increasing intensity in Neuro-Lumbago. A very wide possible sensorium converges in this section of the lumbar region, and exposes it as a field for Neuro-Lumbago.

Under the title and quality of Neuro-Lumbago, with the amplified explanation, like the parson's text, it relies for its application and inspiration, not upon the detail of the preaching so much as fixing the text with the important Gospel word as well as the matter upon the memory.

Just as accumulative nerve stress and nerve irritation within the cerebrum lend to convulsions, so also sympathetic irritations of the mesentery, or organs, if long continued, end in pain, and where otherwise no pain resides. In Lumbago wide and added nerve irritations keep on arriving at the lumbar section of the cord, and eventually these result in Lumbar Pain. As a clinical foundation, the older and well known *Referred Pain* of most organs must evidently indicate the carrying capacity of a nerve arc, from one centre to another centre. Drs. Head and Sherrington have proved experimentally that more than one nerve impression can be carried by these same paths of the *Spinal Nerves*. So that sensitive

circles can be carried from the systemic and sympathetic Nerves, and any badly used viscera can carry their impressions along the sympathetics to the cord; and, when these appear to be abnormal, pathological, and irritating, and with the reflexes of a number of the advertised crowd of ordinary, but also *organ dyspepsias*,[1] these can certainly accumulate and supersensitize the connected centres, and be transferred to the lumbar centres, especially when overworked, or more than ordinarily susceptible. Thus, the Nerve Aggregation factor commences in the extensive peripheral origins and is specifically to be met with in this part of the cord connexion.

The Nervous Onset and Distributing Area.

The Nerve Tank Phenomenon underlying Neuro-Lumbago will now be divided up into, firstly, the predisposing elements, and, secondly, focal irritation, or—I, Preparatory Stages, and II, Determinant Stages:—

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[1] See Organ Fatigue, p. 225.

I.—Preparatory Stages.

Premature ageing has a marked influence.
Constipation.
Bladder and Uterine Disorders.
Enlarged Prostate.
Piles or Procedentia.
Stiffness—Weakness.
Overstrained or Overworked Musculature.
The remains of Sexual or Prostatic irritations.
Any Accumulative Reflexes.
Reflexes from painful joints, tendons or Muscles.[1]
Insomnia—Fatigue.
Chronic Indispositions.
Intestinal and other Toxic absorptions.
Muscular enervation particularly.
Wide sensitizing from disturbed sensorial surfaces.
Tonic or constant muscular action.

II.—Determinant Stages.

Sudden irritations of the centripetal paths to the Lumbar Cord Sections.
All abnormal and acute nerve impulses from the Pelvic or Sympathetic Systems.
Acute attacks or Exacerbations of diseased organs within range.
Sudden Indulgences or Excesses.
Over-exertion—Strains—Cramps.
Various sudden Dyspepsias and other Indigestions.
Spasms--Sneezing--Stretching of *diseased Musculature.*
Strain and damage or torsion of the oversensitized Nerves.
Nervous exhaustion.
Deposits from Nitrogenous and other defective nutritional waste deposits.

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[1] In physiology, the suggestion is here made that the slight muscular location in the Brain Centres activates a small muscle effect, *viz.*, muscle coagulation, and that tenses the tendon's Nerves, and which gives rise to the stimulation of the Autonomic Rhythm centres, and thence all the succeeding and opposing and connected contractions concur. This probable *Part* of a Tendon's Reflex is not really direct, but a rhythmical start of the combined muscle centre.

Much irritation from the Intestines and organs liable to ageing.

Irritation and lost control over Hypogastric, Lumbar and Sacral Plexuses.

Marked irritations of very long Nerves, e.g., Last Dorsal, Ilio-Hypogastric, and Inguinal Nerves; and the *Anterior Crural and Sciatics, and the nerves over the buttock and ischial tuberosity as being liable to temperature exposures and pressures, especially during sedentary occupations.*

Toxins and Lead.

Drugs as strychnine and tonics.

These and chronic stimulations of the cord act as *Predisposing Causes.*

Rheumatism—*and its effects.*

Gout—*and its effects.*

Teno - synovitis — Arthritis — (with the predisposing factors)

Neuritis.

Thickenings around the foramina and tissue plains of the Nerve runs.

Acute sensitizing aura or exacerbations from the periphery or organs.

After Violent Exercises—or *spell of fatiguing work.*

Worn-out Resistance in a susceptible subject.

Nerve strains acting as immediate causes.

Irritative Points of Nerve Origin.

Nerve store precedes the lumbago storm, and as such it may be appreciated how the lumbar region is excessively attacked as one exposed to nervous store. Take the busy mart or muscles of the back, there the muscles must be constantly on change or duty, exposed to wearing and tearing, and *above the*

average. They seem to be in gear all the time. They work constantly, and automatically keep every movement of the spine within a latitude of precision and fixity ; consequently the lumbar muscles and their nerves are more apt than elsewhere to show early signs of strain, overtaxing, fatigue spasm, and degenerations ending in fibrillation and connective tissue incursion, with a consequential hampering of the usual control over the nerve passages through them. These effects accumulate more and more with the overstrains and pressures incidental to premature or ordinary old age. They result in added and continuous irritations and overwork done under crippling conditions.

Weak Back itself is the Actual Early Stage of Lumbago.

An important point occurs *at the turn of life.* Antecedently to lumbago it embraces wear and tear, also gouty and rheumatic deposits, and increase of the fibrous tissue, and depositions and bone fixations, all leading up to irritative changes. It also brings on weak back, or increases the hereditary tendency to weak back. And this condition must be brought under review when looking at a wide survey of the

factors which usher in Lumbago. It places Weak Back as one of the most prominent predisposing conditions for an attack of Lumbago.

Etiology.

Preliminary liabilities and etiology begin as far back as the first degeneracies which follow the greatest activities and inimical excesses of early middle age. At that time, some of the breakdowns or oncoming difficulties show themselves by the lessened vitality and inability to eliminate the waste products of the cells or from the general metabolism. Others, gradually, and simply told, introduce the whole gamut of the coarse dyspepsias.[1] Also, there are the slowing down of the anal, sexual, and peristaltic functions, and the reflexes of the cord centres introducing more irritation from retained secretions; whilst as a vicious circle the lessened peristalsis favours the increasing intestinal sepsis. They all widen the irritability of the spinal cord, and arranged with these potent factors may be discerned others, as over-indulgence, over-feeding, acting as general exacerbations and which in turn may determine a lumbago attack, provided only that the previous disturbance *and other*

[1] Dyspepsias and Noise or ear resistances lead to the heightening arterial strains.

irritant factors towards the lumbar region have first rendered that part liable and vulnerable.

Given this association-picture of the contributory causes, it will be understood how rarely a single focal element, like osteophytic growths, or gout, or rheumatism, or myositis, or actually traumatism itself, can alone cause a lumbago outbreak. And yet it was the predominance of only one of these old main symptoms disproportionately prevailing which unfortunately led many former observers into the error of attributing Lumbago to a definite and single diathetic cause.

An obvious objection may be got rid of here. The lumbar enlargement of the cord ends at the lower border of the first lumbar vertebra. At first sight the pain ought to be up near the ribs, whereas the pains generally appear about the level of the iliac crests and above that. However, the brain, and not the cord, locates the painful impressions, so that the correct distributions follow the nerves, although the focus of origin may be an irritated cord section.

Clinical Aspect.

The clinical factors support these widely distributed areas and irritant causes of Lumbago. On opening the abdomen the contents fit wonderfully

accurately, so that a marble would cause immediate nerve pressure. Clearly, then, at *the waning period of life, being the lumbago age*, a nerve irritant stage only too inevitably asserts itself in the following way. Many increased congestions arise: with enlarged prostate, lax rectum, or irregular-sized intestines start troubling, a more and more rigid pelvis heightens any pressure, and a tendency supervenes to either diarrhœa or constipation. To these may be added a thickened bladder. More frequently uric acid will deposit in the kidneys and ureters. Most other discharges become abnormal. All these give rise to nerve irritation, or discomfort following nerve pressures. The continuous nerve aching may precipitate an overflow from the lumbar centres. And at their end stage they discharge a paroxysm of NERVOUS LUMBAR DISORDER OR LUMBAGO.

Taking next the Vertebræ: strains, pinching, and recent or former damage to the intervertebral discs, bones, or cartilages, joints and tendons, with or without rheumatic, gouty, or other deposits, all will markedly increase the sensitizing of the nerve accumulative impulses.

And, in *Chronic Lumbago*, often associated with bone irritation, the wearing down of nerve control and

muscular tone dovetails into a chronic stage of preparedness as the precursor to any superseding Acute Lumbago attacks.

Similarly, purin or nitrogenous diets, high living, and particularly any irritating excesses of living, very actively sensitize the nerves in weak regions of the cord ; any œdema of the nerves, any secondary rheumatic and gouty manifestations certainly help—*i.e.*, *only help*—to aggravate the previous *new nerve factor of aggregation*, and the final discharge presents itself as accumulative nerve strain or nerve pains. When the nerve tension is pronounced, the slightest movements will sometimes bring on the worn-out, unbearable, excruciating, and darting agonies of Lumbago. [The same happens for other Regional Series of Nerve Aggregation.] (*Vide* Note (1), p. 147.)

With regard to *uratic deposits*, it has seemed to me that the bi-urates or soluble urates deposit only in the tissues exposed to cold or chilling, and especially where the temperature varies, as in cartilages, joints, and connective tissues. I also consider that these tissues are normally produced by being depositing tissues, and so far favour our extraneous deposits. For that reason, the thick planes of fascia around the long nerve courses of the lumbar region will be liable

to these chilling effects *in elderly persons*, and so predispose to nervous and gouty irritations in that region.

Muscular Pains.

In Lumbago the pains have usually been regarded as muscular pains, and hence called a muscular disease. One of the favourite arguments, pointing to the muscular origin, lays confidence on the difficulty of rising erect from the stooping forward posture. But, in Lumbago, it really equally applies to the *front abdominal muscles* after lying down. If it were really muscular in origin patients could not use these muscles at all, without extreme ardour ; but if the movements be carried out very, very slowly they can be used. If the patient can be placed on his side or front, the muscles need not be painful unless the Nerves are stretched. Moreover, analogously to Hip Disease, where the rigidity shows that the diseased bone requires rest, so the neuro-lumbago rigidity signifies the need to steady the injured Nerves.

Here, the opposite or nerve view is held ; the twinges seem to simulate muscular pains, or girdle, or

hypogastric pains, or *Transferred Nerve Pains.*[1] The transferred pains travel from the affected centres to the endings of the nerves ; and these pains undoubtedly are very frequent. They may be noticed at times along the distributions of the Anterior-superior-iliac, the external cutaneous, Ilio-inguinal, or Genito-crural nerves ; also along the Great Sciatic as in the frequently accompanying sciatica.

In support of the Nerve View, the short nerves to the back muscles, especially those in the Quadratus Lumborum, the Erector Spinæ, and the Intertransversales, and to the joints and ligaments will be peculiarly exposed and apt to be pinched ; and they do show marked presence of pain. Indeed, Lumbago may be pictured as an irritated focus (*similar to a Brain lesion*), and the pain accretions pass thence into the nerves attacked in Neuro-Lumbago, or into spasms, or muscular paroxysms, or even muscular convulsions ; and the latter may extend into general convulsions.

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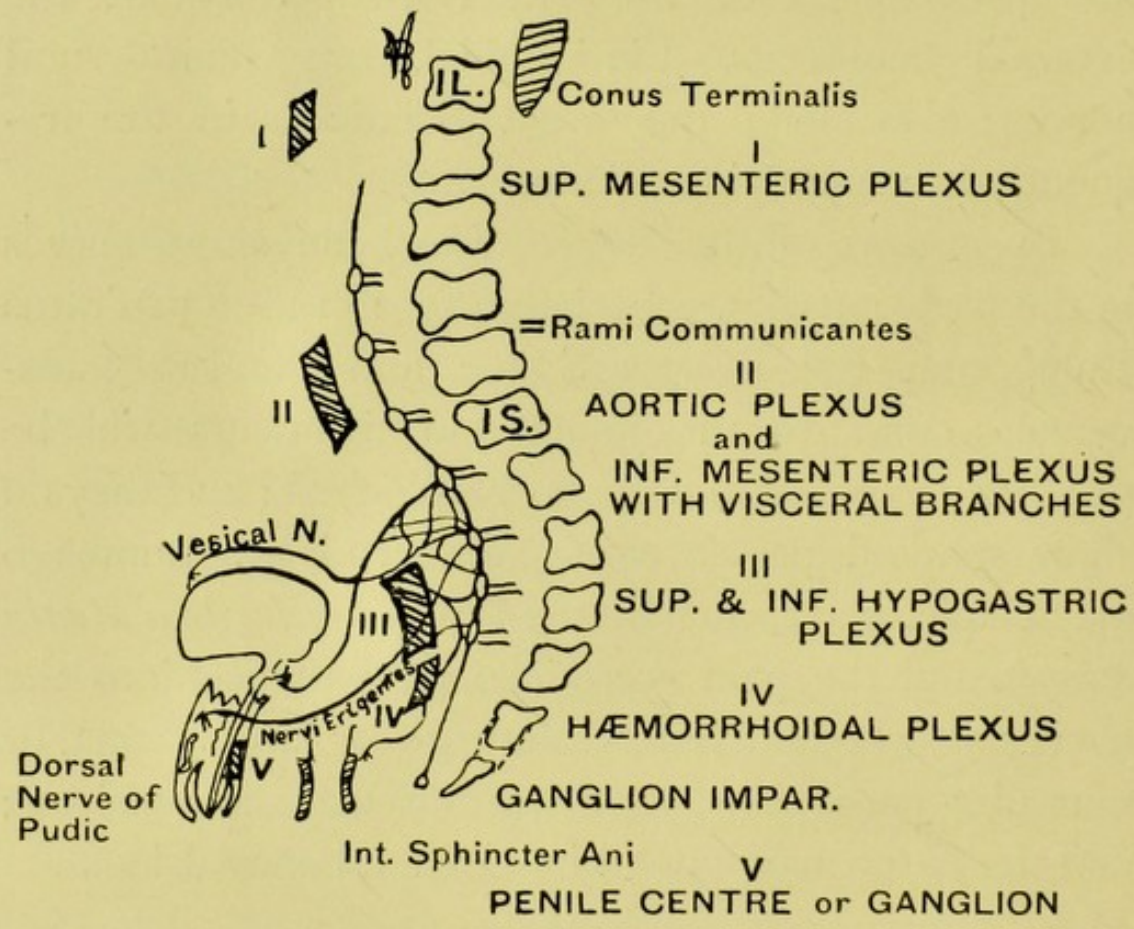
[1] Under the above system REFERRED PAINS travel over as irritant pains from the Diseased Organ to the sensorium.

Sympathetic Scheme.



A SCHEME OF THE SYMPATHETIC PATHS OF IRRITATION AND WHICH EMPHASIZES THEIR WIDE FIELD. THE PLEXUS MARKED V IS THE NEW OR ELLIOT-BLAKE GANGLION, AND DESCRIBED IN THE TEXT.

ANOTHER IMPORTANT POINT is the implication of the *Contributory Sympathetic Nerve Field.*—During the supersensitized state it frequently happens that the sympathetic nerves may be involved, and in that case will be distinguished by the soreness of the abdominal parietes and viscera. In very acute lumbago the passage of flatus even will initiate a paroxysm; just as its expulsion brings relief.

But the one chief feature, all through, depends upon the accumulative nerve irritation for this particular cord region, and from the peculiarly wide contributory sensorium.

A WARNING MUSCLE SYMPTOM, WEAK BACK.

Weak muscles constitute a very peculiar and predominant feature during the course and pending onset of Lumbago. In one form or another muscular debility and exhaustion prelude the greater and greater loss of nerve control. For instance, rheumatism may predispose, but it will be found to be due to its effect in producing accompanying muscular degeneration and weakness. Old accidents, too, may be said to predispose; but, then, the pains, irritations,

and pressure on the nerves assist in the production of the muscular weakness and will outline the injury. Previous nervous or some other form of myositis equally weakens the muscles and acts as a premonitory feature in Lumbago. Especially does this condition apply to the largest class of persons so liable to Neuro-Lumbago attack, namely, those who have been adepts at violent exercises and sports, old athletes, mountaineers, trade workers, and, of course, the well-known class of gardeners—there, gradual exhaustion supervenes, and, sooner or later, it passes into a lumbar muscular weakness or stress or a case of WEAK BACK, following the outcome of *WEAR BACK*. These subjects often drift into the exhausted throes of Lumbago. Indeed, all through, a distinct and antecedent symptom may be attributed to weak back.

This antecedent weakness of one or more muscles should always be looked for as a characteristic, and a most prominent premonitory onset and asset in cases of Neuro-Lumbago symptom.

Continued nervous weakness accompanies the weakness of the lumbar muscles, and runs parallel like a secondary vicious circle, and it should be correlated to the process. It certainly acts as a com-

bining factor, a sort of starting drag ; and as a chronic, persisting stage liable to pass over into acute attacks.

THE POSTERIOR SPINAL GANGLIA.

At a later stage, the overworked and damaged posterior root ganglia of the cord at least plays a part, in exchange and collecting, for it lies in the direct track of the supersensitization of the cord in Lumbago ; and it may also be the seat of contributory irritation. That influence must help to weaken the muscles, and deserves a passing note thereon.

Overwork and irritation, like the coarser laboratory experimental injury, causes, as experimenters say, shrinkage of the corresponding muscle fibres. Waller formerly attributed that distrophy to the influence (unexplained) of a problematical (unexplained) trophic centre.[1] Well, it appears to me better, and more simple, to explain it clinically as a *nerve energization interference*, and due to the cutting off of the usual physiological tone energization. At least we can observe, and know, that

[1] Why should it be *Distal Trophic* at all ? Why not, as I suggest—the energy of nerve work promotes a *Local Trophic* increase. *Vide*, also, " Nodes of Ranvier," chap. iii, p. 20.

to be the only clinical physiological function. The laboratory damage introduces the error of injury.

Now, in Neuro-Lumbago it is exactly such a general nerve interference, following after super-energization, that precedes a similar disorganization of the nerve paths. So, surely, overwork, or stress, or damage, by oversensitization and irritation sufficiently impinges and impedes the function of the posterior ganglia; and that would throw the muscles out of physiological gear through the arch convection channels connected with the polar cells; and the loss of tone and work would be quite sufficient to entail lessened nourishment and oncoming weakness.

A similar interference or weakening of the posterior ganglion function, in a vicious circle, would lead to, and fully accounts for, the chief part—other than a constitutional tendency—in the development of Weak Back.

HOW TO WATCH FOR THE SYMPTOM.

To elicit this STANDARD SYMPTOM of muscular weakness, every sign of stiffness should at once be noted. The patient also complains of easily becoming tired, either before, or in, an attack. And

during an attack it may pass further into an uncontrollable myotonia, or spasm, or rigors of the whole or a part of the muscular system. Altogether, this weakness and loss of a healthy and formerly robust muscular tone can safely be taken as a significant and valuable symptom, and perhaps still more valuable as a premonitory sign towards the introduction of a strong liability to Neuro-Lumbago. It refers to and attacks one or more individual muscles in the lumbar quadrant. So it ought never to be overlooked.

In preventive treatment, once Weak Back has been diagnosed, the less work given to the weak back the better for the patient. And assuredly it will be about the first and the best means to warn and ward off any pending attack of Neuro-Lumbago.

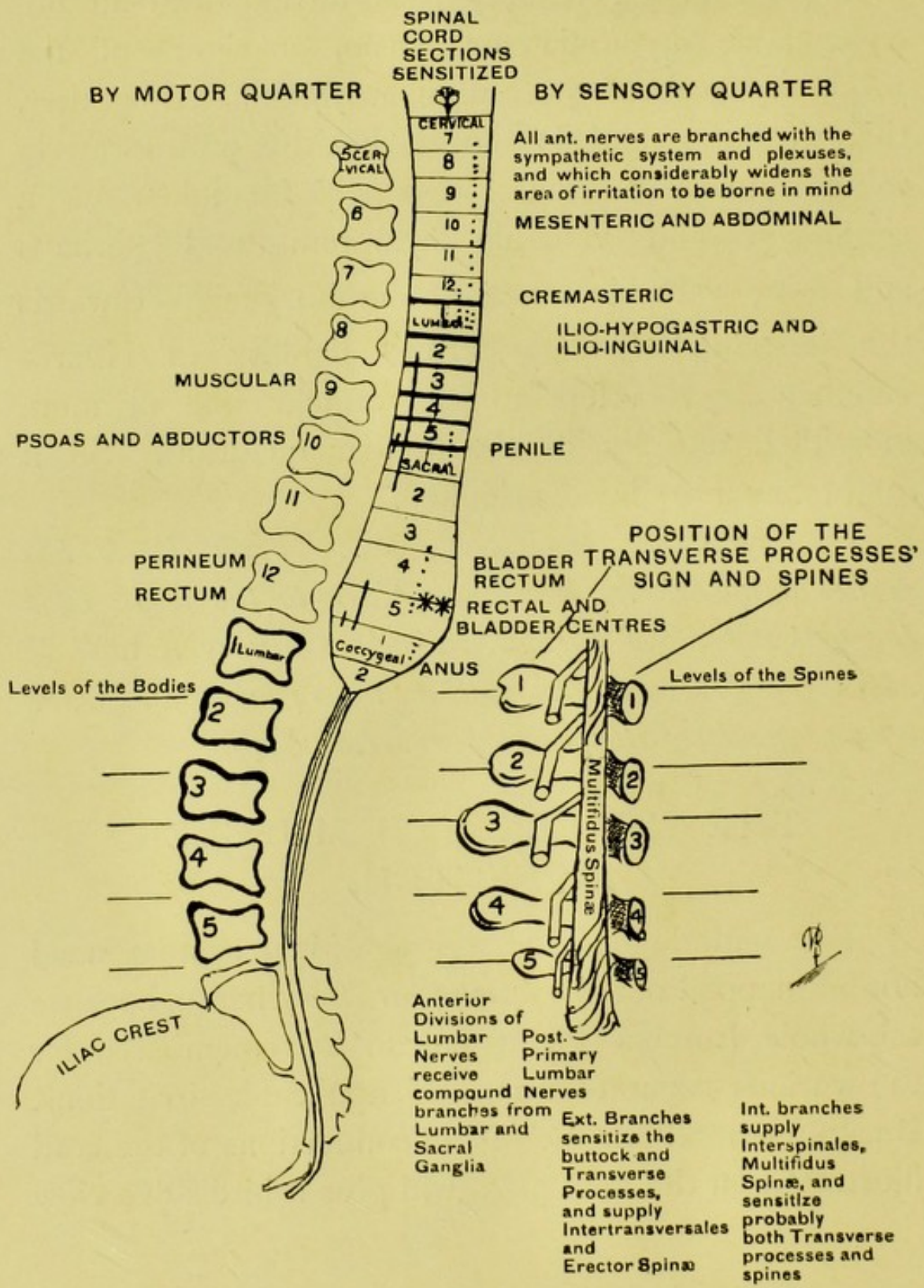
THE NERVES AND MUSCLES AFFECTED.

The underlay of the aggregational system need not be mapped out *de rigueur* for every nerve, because the whole Lumbar Plexus has to be remembered for the various separate quota of applicable irritations. But the general scheme of the connections of the cord illustrated on the next page will give a bird's-eye view

Nerve Aggregation Schema

In Lumbago and other Relations

And for the Transverse Process Sign.



and prove useful. And it may be borne in mind as indicating the essential splitting up of the different sections, and possibly the correlated sectional connections in different attacks, that this systemic view is very different to the old narrow rheumatic path and pathology of origin.

The Schema opposite draws attention to the availability, the likelihood, and the vulnerability of the foci of irritation, and to their origin, and to their forced concentration in variable sectional areas. And these contained accumulative forces act as centres of distribution. Many of the predisposing conditions may be conveniently tabulated; and they cover the different plexuses and sympathetic distributions and connexions, according to the contributory and irritative nerve force deposits. This Schema also serves to demonstrate the contributory areas for other Nerve Aggregational conditions. Certain sections can be seen to be more exposed to irritation than others.

1. The length of the Lumbar nerves offers a constant *predisposing factor*—a liability to irritation and damage.
2. The felting and mass of delicate sympathetic connections induces additional irritation.
3. The peculiar, irregular, and muscular distributions of the nerves add to the irritability.

4. The great mass activity of the regional muscles helps. Walking and moving keep up a continual neuro-tonic effect.
5. One of the most active and strong muscles, the *Psoas*, is encountered in this region, and accounts for *periodic*, overwrought, and overspasmodic irritations.
6. The broad fascial planes, thickened foramina, and coarse channels surround the delicate nerves, and provide further grounds for deposits, pinching and stretching.
7. The cutaneous twigs and their pressures, with want of suppleness, multiply the short derivative irritations.
8. The short posterior Lumbar Branch Nerves embedded in and irritated by the plenitude of thick muscles supplies extra nerve force to the centres in the cord; and the *EPITOME* of the nerve irritation going on in this cord section is quickly reflected to the Posterior Branches ramifying over the Transverse Processes, and, *in this particularly exposed situation*, supplying the TRANSVERSE PROCESS SIGN, to be explained in the next division.
9. Nerve or Pain force is very liable to reach the cord section from the irritated Rectum, Coccyx, Buttocks, Legs, last dorsal on upper abdomen, or lower hypogastrium via the ilio-hypogastric nerve, and other surroundings. REFERRED PAINS along these nerves occur frequently, and it demonstrates that Neuro-Lumbago could not be a joint or fixed muscle disease. Other referred pains may here be easily traced, as pains darting down the External or Internal Cutaneous Nerves, or the Crural and Genito-Crural, and more rarely along the centrifugal ramifications of the Sciatic Nerve. Reflexed pains thus also

reach the joints, vertebræ, and ligaments through the sensory and sympathetic distributions.

10. THE GANGLIA on the posterior sensory roots would after a time be essentially attacked. But considering the other ample ramifications of all the other nerves to the *Sectional Areas*, and the muscular sources of irritation, and the Special Centre areas of the cord, and the irritations therefrom, the Ganglia alone could not be the sole cause or seat of origin.

11. The whole effects, then, in Neuro-Lumbago must be taken together, as forming the groundwork on which it is here regarded as a Sectional Cord disease. [*This is much after the conformatory view, here held, that the brain works because of the Active Tone kept up by the widely connected Basal Ganglia influences.*]

12. The Sympathetic and other organ plexuses and ganglia also connect up the cord sections. And the reflected pains to the intestines and mesentery can be often appreciated as stiffness and soreness.

All the chain of ganglia, and the hypogastric and prostatic and other plexuses send branches to the anterior spinal nerves; whilst the prostate, bladder, rectum, cæcum, kidney, and increased fat in the mesentery must concur in setting up more or less chronic irritation in elderly subjects. Therefore the sympathetic system decidedly plays a more important part in Lumbago than ever dreamt of before.

13. The occasional overworking of all the various Autonomic Centres of the Lumbar Sections of the Cord completes the picture of the many-sided paths of nerve irritations which contribute to the all-invading view of the genesis of Neuro-Lumbago.

The Psoas Muscle Function.

It may be worth while drawing attention to yet another new fact, as I discern it, about the arrangement of the Lumbar Plexus. This Plexus is embedded in the posterior part of the Psoas muscle, *and as that muscle moves more than most of the muscles in this region it physiologically and normally activates or continues the activation of the embedded Lumbar Plexus.* And this peculiar interdependence and arrangement perpetuates the normal tone of the lumbar and linked-up sections of the Cord. Especially will it account for the recurrent rhythm of walking and similar leg movements.[1] Abnormally or pathologically, or when the movements tire, and

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[1] Nerve Aggregation entirely alters the whole field of Physiological Nerve action. Even the Walking Reflex (as above) has been claimed to be activated by co-ordinate nerve force impressions (*e.g.*, from the coagulation stretch of muscle pulling the tendon nerve endings, *vide* "Nervous Onset, the Preparatory Stage," line 14, p. 95). In the above instance, the walking movements are so necessary that the plexus arrangement within the Psoas constantly supplies a considerable quantity of "Nerve Aggregation" or sensitization to the Walking Co-ordinate centres, whether connected through brain, or Lumbar Cord, or balance centres.

when in excess, this system considerably adds to the culmination of nerve energy in cases of nerve energization attacks—as in Neuro-Lumbago.

A TRANSVERSE PROCESS SIGN.

(*Illustrated in the Nerve Aggregation Schema, p.* 110.)

My Transverse Process Sign will now be discussed. As a clinical indicator and significant symptom in Lumbago, it will be found invaluable. The Transverse Processes can be singled out, because they are the largest anatomical structures, and they are well supplied with nerves. They also happen to be nearest the affected section of the cord and so they react quickest along the shortest track and sensitively reflect the irritative process going on in Neuro-Lumbago. This area, then, attests to the attack of the sections, and *yields a summary* of, and describes, the focal symptoms. All the nerve connections of the section spread out the distribution of pains fan-like. The shortest avenue travels first and foremost to the posterior internal and external divisions of the posterior branches of the lumbar nerves. These latter

supply and sensitize the structures over, and the muscles attached to, the corresponding Transverse Processes.

The method of observation of this sign is to appreciate the lightness or heaviness or degree of touch which elicits the varying amounts of pain. The pressures required and the grades of tenderness, from discomfort to agonizing pain, indicate the variable conditions of irritation. The Transverse Process Sign demonstrates the common part of the Cord attacked; and its convenience and directness enhance its value.

The old forms of spinal sensitiveness occur in all diseases; but, as they spread out too confusingly, and almost universally, they therefore do not so exactly answer for Lumbar nerve differentiations, and certainly not for Lumbago.

[But the coccyx may sometimes be noticed to have a similar sign to itself, passing through the Coccygeal Cutaneous Nerves. The Coccygeal Sign does not constantly, nor so frequently, nor so characteristically arise as the above Transverse Process Sign.]

The chief Process affected, and, as it happens, the most conspicuous Lumbar Transverse Process to give this sign, is the third one; and it should be preferred

and mapped out when possible. It can be felt just above the level of the highest point of the iliac crest, and about midway between the sacrum and the last rib, about 2 in. or less from the Lumbar spines. That might be called and usually can be drawn as a promontory or *Lumbar Oval.* Of course, *any* corresponding Transverse Process associated with the section and the nerve connections will accordingly give this exact sign. The supersensitized area around the complicated muscles which arise from these Transverse Processes must obviously aid and increase the *Lumbar oval* area nerve sensitiveness found with the neuro-lumbago premonitory phenomena. Special notice should be taken of the Small Intertransversales, also connected with these Processes. It is a nice and instructive distinction to say that through their substance actually these delicate and disturbed nerve fibrils pass. Therefore both the nerves and muscles themselves are peculiarly liable to become exhausted, and so give rise to the most excruciating spasms felt there, *most typically so*, in bad cases of Neuro-Lumbago.

The Transverse Process Spots are also muscular foci, and as such do play a part from the many attachments here, and the consequently disturbed painfulness

of the transverse spots accounts for the great difficulty felt by patients in moving or obtaining any postural comfort, respite, or ease. The poor sufferer with those postural attacks, and when it is so hard to rest with any comfort, should therefore be closely studied; and *all movements must be made slowly*—the key-note of relief depends on moving *ever so slowly*. Conforming to this same principle, the straight-backed firm chair, a level and not resilient bed, not too long in one position, firm supports and belts, and well braced clothes, also conduce to relief, and fulfil one of the objects to promote fixture, quiet, and ease.

Again, from the patient's side, the Transverse Process Sign will be found by him to increase as an attack is pending or progresses. So that, if regularly felt by the patient, as gently as possible, it will readily and faithfully serve him as a *danger signal*, to ward off the onset of the—or a future—attack.

NEURALGIA

NEURALGIA CONSIDERED ON THE BASIS OF NERVE AGGREGATION.

CHAPTER I.

NERVE pains in nervous diseases, tumours, referred pains, pains from the stomach, liver, pancreas, and from other organs or sources constitute non-accumulative, but accretive neuralgias of a distinct order; and they must be treated apart from the previously considered compound accumulative series.

Taking a broad, practical view of Neuralgias, two main groups will be formed by them: (1) SINGLE CONDITION ATTACKS, which embrace most single nerve pains, and the simple neuralgias; (2) COMBINED CONDITION ATTACKS applied to and containing the cases where the nerve origins and excess nerve forces have spread from other nerves than the chief

nerve attacked. (Neuro-Lumbago would be in a separate class and belong to an extreme division of the Second Group.) The nerve aggregational method presents the new basis of this system, and more clearly maps out the sequence in pathology; it improves on the old view of non-explanation, and only gross observation, and non-location of the text-book Neuralgias.

Sub-stages will provide for distinguishing the effective origins of the Neuralgic attacks, as due to: (1) The Direct Focal Action, (2) Indirect Focal Action.

In all Neuralgias the irritation begins at one or more foci; and when continued to a point of non-resistance, becomes disorganized or overflows, and is appreciated as pain. According to the direct or indirect focal action it remains localized to the ordinary single nerve trouble, or spreads in its effects to the surrounding nerve terminals. And that description and system answers better than the meaningless divisions into symptomatic, sympathetic, and organic, and functional differences; instead of fixing on a real action in the Neuralgias and so tracing them to their origins.

DIRECT NEURALGIAS.—Direct-action neuralgias

proceed from single nerve attacks, the nerve force coming from single nerve areas, or even single conditions of irritation—as a cold, polypus, piles or fissure, caries, or starting pains anywhere. Of course when excessive, the pain may spread and become an Indirect Neuralgia. In a Combined Condition Attack the simple neuralgia may trace its single source from this principle, *i.e.*, a neuralgic *point d'appui*, as a decayed tooth, or wind spray, or tic douloureux, but this may not be effective until fortified by some other combining factor from inside the nerve, or outside, or near, or from *other* nerves, or from debility or common and organ dyspepsias, catarrhs or any other intercurrent nerve irritations. It is *the amount of nerve force precipitation* that determines the degree of the pain, aching, throbbing, continuance, and the exhaustion in the more prolonged attacks of any variety of Neuralgia. That is why the analgesic Coal Tar Series of drugs that soothe the nerves *widely* easies local pain.

If in a Single Condition attack, with Direct neuralgia (*i.e.*, effect), as starting with a Single Facial Neuralgia, then, if other association nerves from tumours or throat or ear mischief supervene, the added irritation transforms the attack into a Double or Compound Condition Neuralgia.

Similarly, if the nerve overflow pains are so great that other distributions from the ganglion or the cortical cell connections are affected, the effect becomes an Indirect neuralgic effect. This latter influence more lucidly accounts for the difficulty experienced in understanding how a neuralgia continues after removal of the Gasserian Ganglion for Facial Neuralgia ; it was an Indirect Neuralgia, and persists from the other sources. As a proof of this extra nervous activity, it may sometimes be clearly shown in the congested or pink supply or state encouraged by the mild arterial activity of the ganglion ; and it should not be confounded with inflammation or damage.

All Single nerve pain accumulations or the well-known referred pains should be placed under Direct Neuralgias ; they all show definite nervous or irritative accumulations : *e.g.*, Costal pains, Trousseau's (or rather Valleix first pointed this out) tender spines in Herpes, Fracture and hurts of all kinds, Liver and other organ crises (mostly Indirect Neuralgias), the large number of Dyspepsias, and organ dyspepsias, or milder derangements, and other Intestinal and Organ pains, Cardiac angina, Stone, Tumour, and practically all reflected or located pains.

Trousseau, by far the most painstaking, and wonderfully clear-sighted clinician, did not know or describe Lumbago, although he quotes many of these old cardiac and referred pains, and especially pelvic and lumbar tumour referred pains; and he associated inflammations of the Cord as well as abdominal tumours with pains of the Spines of the Vertebræ like the clinicians of to-day.

Yet another welcome proof of the idea of the nervous aggregational overflow refers to the obvious and extra activity going on in some of those severe cases of referred pains, and which spread or discharge, demonstrating the conditions with flushed and nervous colourings, loss of hair, sweatings, trophic skin changes, desquamations, muscular twitchings or contractions, or even convulsions.

INDIRECT NEURALGIAS.—These have been partly dealt with. Generally they indicate a wider distribution of the effect of extra nerve accumulation; and are so often associated with added or compound nerve irritative origins—as where debility, loss of tone, digestive troubles, nose troubles, or ear or eye strain, &c., intervene—that they conspire to increase the nerve source activity going on, and consequently the overflow spreads. The great

variety of Headaches come under this heading. They, therefore, should usually be traced to more than one source; and correspondingly wide distribution should be looked for.

IN TREATMENT, a wider outlook upon these irritations should be borne in mind, and they will lead nearer the complete cure than the single "one origin" cures. In Headaches and Neuralgias, the so-called inflammation with throbbings of the nerves should rather be regarded as overflow or congestive activity and due to a nervous sympathetic œdema and sensitization—they should not be regarded, and do not belong to the damaging and irretrievable inflammations. Under treatment, with hot or cold applications according to the stage, or sedatives, or more quiet and rest to the nerves, this pink condition (short of inflammation) will duly subside.

Under the present wear and tear and the worries of hard living, Laws enforcing more quiet are imperatively called for, and are absolutely necessary, and as soon as possible for the lessening of many of these preparatory nerve troubles, and for the Public Health, and for the well-being of the Nation, and all people.

CHAPTER II.

NEURO-BRACHIALGIA.

A DISTINCTION must be made for Neuro-Brachialgia, as against the Simple Direct Cervical or Costal Neuralgias, or the Plexus Neuralgias that have been commonly described. Neuro-Brachialgia corresponds to the similar lumbar prototype, as described by me; and begins by a wide accumulation and continued nerve agitation from the contents of the exposed Dorso-Cervical Cord Sections. A similar nerve aggregational factor can be relied upon at the onset; and follows, as in the lumbar region, consequently upon the greater elective activity of this peculiar region, and dominated by the centres—as *those presiding over the great arm activity connexions*, especially writing, and the extra nerve force exactions of present-day skilled activity, also present day strength and smartness; all require extra force and professional nerve nuances and adjustments; all require marked calls upon nerve exhaustion, and they

are *all liable to strain, excess, overbalance, and to wear out at early and provocative dates.* Then, again, the constant thoracic functions from heart and lungs, and the liability to pulmonary asthma, bronchitis, cardiac disturbances, treated tuberculosis, indigestions, or the inevitable common dyspepsias, and intercostal irritations, very easily intervene or overflow their accumulations of nerve forces so as to supersensitize these overworked brachial cervical sections of the cord. The *Nerve Supertone* may be enhanced by intercurrent strain, overwork, debility, wasting, and neurasthenia. Also in Neuro-Brachialgia, as in Neuro-Lumbago, of course gouty and rheumatic deposits do occur, as in the local or spinal synovia or tendons or muscle sheaths, but they only help to disable the patient, they only incur an addition to the Nerve Aggregation.

Here, as elsewhere, if it were only due to myositis, or root disease, or a neuritis, as held up to the present date, the relation would be constant, and it is not so. In rheumatism the lost power, œdema, and disablement may or may not persist, in Brachialgia the tendency to pain alone subsists. In Neuro-Brachialgia the pains only concur with Rheumatism *plus* the chief nerve aggregations in this region, and which precipitate exceedingly painful and recurring

anguish in Neuro-Brachialgia. Moreover, the disabled working or the peculiar liability of these nerve sections to recurrent attacks may continue after the disappearance of the fleeting rheumatism. Such a diathetical incidence, a non-eliminatory disease, —with the accumulating and tetanizing uric-acid derivatives — although not always and necessarily ending in a damaging or a poisonous accumulation, no doubt they frequently account for almost evasive and unknown irritations; and, especially in this region, to extra nervous supersensitization, and determining a Neuro- or Cervico-Brachialgia.

All through, the nerve storm indicates the combined vulnerability. So, it happens that after large feasts and banquets the nerve irritations from the ill-eliminated poisons, the lethargy, the vulgar dyspepsias, the abused organs bubble over and sensitize the cord sections into a nerve-wrought stage which easily and agonizingly sensitizes some damaged muscle, or tendon, or other sensitive and supplied nerve area; with the result of a local and distributed attack of Neuro-Brachialgia.

The Lumbar and Cervical enlargements of the Cord represent the two largest irritable centres of the Spinal Cord. And the most frequent associations of

nerve reinforcements blend in these sections. Hence to these natural sources of liability to overaction and sensitization must be attributed the above Compound Accumulative Nerve Attacks.

GENERAL TREATMENT.

This book does not aim at presenting a copied treatise; nor a recitation of treatment. Still, treatment must duly apply, and it can be made to continue the interest.

Doctors differ from quacks by the individuality of their treatment. And the treatment of Neuro-Lumbago proves no exception to the claim of personal and symptomatic treatment. The usual drug, Spa, and electric, High-frequency, and other applications to assuage pain are too well known to need repetition. But the exercise of some reserve should cause hesitation before having recourse to needless applications of some of the old methods, although they may have an occasional vogue, such as—counter-irritants, or mustard plasters, or the old cupping, now too pretentiously resuscitated in a form short of inflammatory hyperæmia (as Bier's

suction), and needle pricking to eliminate the lymphatic stasis, if it rarely exists; very likely they might increase rather than relieve the all-important nerve aggregational irritation.

It will be better worth while to attend to the principle of limiting nerve aggregation; and this new curtailment, by ferreting out the available nerve-end sources of irritation, can relieve as many as possible. It will be found a valuable adjunct to any rational mode of treatment. The summary may be put into one word—aim at Rest. In this direction the most general indication and the *First Stage* should be to impose a general *Body* and *Nerve Rest.* To that end *First* starve with toast and water and Home Hydropathy, so as to assuage and drain and dilute the *corpus vile* of its many irritants and wastes, and urates, and ptomaines, &c., and very likely lead, or of colon bacilli, or perhaps syphilitic poisons. [*Which latter, by the by, seem to me to* promote a fever intermittency of a day or so, recurring in six weeks, or irregularly sometimes, and noticed by me long before Schaudinn's demonstration of the *Spirochæta pallida.*]

Home Hydropathy also increases the blood power and makes it the best of solvents, as well as promoting the diluent and germicidal power. Home or real Spa

treatment with increased potations of distilled water and added salt (which improves the thirst), or with some of the numerous artificial sera, carries on the suggestion, so as to cut down purin and other poison intakes, and it promotes nerve health.

Undoubtedly a watery aperient should be administered as it also eliminates effete irritant products.

Depuratives, diaphoretics, and diuretics might be added.

Spa places are beyond the reach of acute attacks, though in the more chronic conditions, Bath, Harrogate, Contrexéville, or Aix, or Carlsbad and Baden, would only touch the fringe of the number of other places suitable in Neuro-Lumbago and Neuro-Brachialgia.

Vegetable and liquid food diet should be adapted to the weakened system, and continue the advantage of the rest and water system of treatment here advocated.

In less severe cases a shortage of carbohydrates and strong meats may well be adjusted. But often some light meat and light wines do conduce to a very desirable sense of *bien-être* and self-satisfaction. Life on this earth can only be spent once, and may as well be enjoyed a little now and again, instead of being

over-cursed by over-legislation. [All legislation, especially as the insane "Bird and Animal Protection Acts," ought to be repealed or revised every five or ten years.] By careful diet a minimum dose of superfluous Nitrogen can be regulated by estimations by the Djeldahl method.

After a week of "toast and water" chiefly, or sooner if the crisis has passed over, and also in more chronic stages, hot baths may be introduced, or mud baths, or saline baths, or saline enemata; or thermal lamps, electric treatments (from Intermittent to d'Aarsonval High-frequency Currents) or other Spa treatment may be well borne and continued; and the body in the usual way should be generally further physiologically cleansed.

To ward off attacks, the same sparsity or regimen continues, with low diet, plenty of soft water, or boiled water flavoured with orange, &c., but no sugar. By water, according to Pawlow, the appetite and gastric secretion will be improved; and by hydropathy any accompanying atonia and any poisoned type of dyspepsia will be dispersed or abated. In these persons, not too far worn out, the flushing treatment will also suffice to considerably lower the accompanying arterial high-tension pressure.

Drugs : Whatever may or may not be said about drugs, they can be used to apply to symptoms, rather than covering any nerve system. Many have long been successfully applied ; and some of the old ones still have a vogue, as—Calomel, Warburg's Tincture, Quinine, Butylchloral Hydrate, and even Actea Racemosa, and Tincture Guaiaci. But those chiefly used as for the pains are now the Salicylates, Antikamnia, Acetanilid, Antefibrin or Antipyrin, Phenalgin rather than doubtful Veronal, and for excessive pains still Morphine rather than Opium.

Bulky packs, hot or cold, may or may not soothe, they often irritate, or rather increase the rapidity of nerve transmission ; in that case soothing linaments or heated wool may be advantageously applied.

When once the area has been sensitized in detail, and the local or muscle or nerve strain explodes the agonizing attack, it is sure to extend to other muscles. The immediate indication should be to rest those muscular plains, and encourage gradual relaxation. Imperatively rest the tetanized muscle with the nerves in one position until the spasm is over. Try to find any sound muscles to do any bending work, and lie so that the sounder side and muscles are more taut than the weak and irritated muscles. Encourage

sleep so that any waking start shall start on the healthier side, by reposing or lying on the painful side.

In the chronic stage, rest may best be obtained with hard instead of curved, dropped or resilient beds and mattresses, and stiff cushions; hard seats and firm supports limit the painful jerks. Add to this, a culture of more or less ascetic surroundings. And at least dietetic moderation will round off the general cure of these Neuro-Lumbago and other Nerve Aggregational cases.

Remember, during all painful movements of the body adopt slow tactics, do not jerk, move slowly, *oh, so slowly!* Let the sound muscles on the sound side do all the work.

Ave.

To clinicians, for a single syndrome of disease, it has been hoped that in this introduction to a wide subject, in a very short space, yet of surpassing interest in many fields, and in those in which several nervous symptoms have to be considered, the suggestions above touched upon may have proved worthy of acquaintance and general acquiescence.

As to the future, the expansion of the subject must revert to their hands, because all that can be expected from one man is, not so much to regard the common acceptance of empty moral suasion, or spiritless grammar, or narrowed scholarship, which only concern himself, and are generally worthless except to his person, and soon pass away as the waste of the centuries, but that he should find more store set upon and do his earthly little with assistance, assiduity, and duty here on earth, and as usefully as possible, for the good of mankind.

RARA AVIS.

FREE PATH EXCURSIONS.

ARMAMENTARIA.

FREE PATH EXCURSIONS AND ARMAMENTARIA.

The Free Path Excursions in Medicine, for brevity, must be written in the form of paragraphs or paragraph monographs, and not in the illimitable form of research which all might follow differently, and then not indicate or interfere with the original mind. And they will be pursued, not only over *excursus*, but to wander over published and unpublished views, and to *armamentaria* which formed part of a paper read before a local division of the British Medical Association ; and so that the published parts may still be presented for the advantage of those whose reading may not have commenced at the time of many of my first introductions.

THE PERINEAL BANDAGE.

A TIED PERINEAL BANDAGE

FOR PERINEAL AND ERECTILE TROUBLES.

A SUMMARY REVIEW ON NERVE REFLEXURE.

In an electrically excited nerve cell and nerve, or in a nerve reflex, the rapidity is marked, because of an unequal or false laboratory potential. Yet there is a time gap beyond the nerve carrying, and it has not been explained. Therefore the natural impulse is quicker than the artificial. In natural excitation it is negligible, so there must be something insufficient in the extra or false potential of the electric excitation. The difference, I think, must foregather in the cell and in the central exchange of the reflex. Undoubtedly in *natural* nerve action the gathering, or the multiple phenomenon of nerve irritation, stands out equally as this covering feature, and it should be associated with the normal capacity of every nerve

cell and nerve phenomenon centre. Even in the quick return of the brain flashes, or mental reflex, the teeming, and *necessarily multiple*, associations clearly prove that any thought reflex does not occur in sleep abeyance; it only responds in full action always to wide and multiple, regular, component compound, basal, kinetic, and motor antecedents, tributary to the nerve synchronism. To that widely-distributed and well-discerned character for every nerve reflex, the name of *Multiple Reflexure* should be attached. In brief, in my view, nerve action or nerve reflexure depends upon, not a single reflex, but upon a local or central accumulation of nerve forces foregathered from numerous origins, and incurring a storing in the cells or nerve centre. It explains why the smallest life current increases effectively; and yet why the laboratory current has to be overpowering to act eventually. It admirably simplifies and answers for the gamut of nerve conditions as a whole.

To apply it to one of the innumerable practical uses may be serviceable, for the sake of an example: take the discussed question of involuntary muscular and piliary follicular erectors, or the erectile tissues like the platysma, or the cremasteric fascia, or the cavernous tissue. In their habitual action many

more causes than one surround these reflexures; and multiple reflexure must therefore be frequent and practically dominant. Nature, as a law, knows no exceptions. If it were only a single reflex it would have to have an internal or integral centre, and so be deranged by any one factor; and it neither occurs, nor could it act.

Again, it applies to one other discussed example, and only answerable on this proposition of *multiple reflexure*—the cardiac irregularities in the latter stages of heart diseases may here be typified. All of the irregularities will then be put down to the more obvious explanation of excess nerve impulses arriving and dislocating the centres. Of course, the heart-beat itself must be taken as due to multiple end and exogenic causes; not as a direct centre as formerly. Thus immediately it gives the reason for the irregularly prepared centres, and consequently for the irregular beats, and arhythmic or fibrillar cardiac work done. That is more practical than writing volumes upon the facts and curves of "*reaction time*" as has already been amply done. The dilated walls, the rough and beaded edges, the back pressure, the irregular tension, and other pathological states help each to produce the irregular expression of, and these particular and

irregular preparations of, the heart's centres, and overflowing into the heart's irregular beats.

In any state or disease these connexions must always be found, and built and linked up together, and they connote that kind of nerve reflexure to be a reflexural junction or preparation.

The New Nerve Preparation should be divided into two parts :—

I. AFFERENT PREPARATION, which promotes the susceptibility of the centre, as in one of the erectile centres. It will be gradually increased from all the ordinary channels reaching that centre; and more so in the instance of the cavernous erectile tissue with extra irritation as from piles, urethral irritation, or other abnormalities, and often found clinically demonstrated in Locomotor Ataxy.[1] Or it may be observed in the case of psychical fear, as with the play of the platysma. Or in other cases from any cord sources of innervation. Or possibly through the effect of external drugs, like alcohol,[2] that may reach the centre.

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[1] Locomotor Ataxy is aggravated, but not caused by, stricture, as some clinicians have claimed. I have always thought syphilis, according to my habitat focal view of diseases, only attacks or settles in otherwise injured or slightly inflamed areas—as the shins, overworked areas of the meninges, cord, brain, liver, or bowels.

[2] *Vide* "harmless" p. 187, "harmful" or recitation p. 66.

All indicate the habitual, and possibly extra, *multiple* channels of Nerve cell innervation.

II. The Added or Determinate Reflex: Whatever the previous organized conversion of nerve force has been, besides this multiple factor for susceptible work, a more rapid and final cause must also enter. In the case of the involuntary musculatures, like the platysma myoides, it may be equally due to mental fear as to a mechanical scratch; or in erectile nipple or satyriasmus after extra or continuous or excessive external preparation, by a sudden fright, noise, or bya bowel complaint, or suckling a baby, or one or other of the well-known mechanical causes, till it will discharge that centre.

Of course, voluntary muscles may also continue in action after the first flash of innervation; but the mode of action is quite undescribed if not taken in that usually congregated way by physiologists. However, even then, I suggest that the slight nerve change or rapid brain flash affects the myosin rods; and after this slight contraction the tendon tension innervates or *continues* the contraction from the centre.

In the above practical and customary involuntary muscular actions, of course both bipartite preparations will be found more highly charged under abnormal

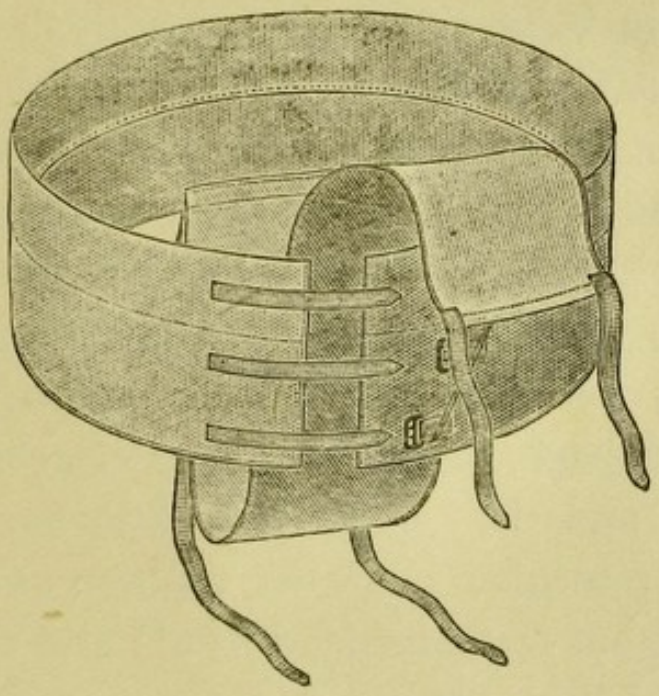
and pathological weakness, and more susceptible to otherwise small, natural, or accidental irritations under causative influences.

In the treatment of these irritative cases, both the sensitiveness and determinate causes have to be counteracted, and the primary and secondary, or the afferent and determinate channels, altered or stopped. In the case of satyriasis or irritations under any abnormal conditions, mental strain, distress, symptomatic effects, noises, any outside influences, should be avoided. Worry and excitement has to be abated; and, therefore, quiet and rest should be enjoined. Other means will be found to allay urinary or bladder irritations, such as stone, and many others both in the urethra or bowels. Walking or dancing, or the movements of the thighs, and all violent exercises must be avoided. Quieten and soothe any busy, ancillary, or luxurious mental habits or states of excitation, and again exclude riot and noises as ancillary impulses. Moderate high-living and indulgences, and use mild foods. In other words, limit or moderate the multiple channels of nerve preparation of the centres. In short, dwell within austere monastic rule; repose in a refinement of Wellingtonian simplicity; affect hard fare and hard bedroom furnishings.

Mechanical restraint can be extended to mechanical aids. The ears may be stopped by wool, or better still, and in a cleaner way, by the Elliot-Blake external Tragus Truss illustrated on p. 168.

Drugs provide a fleeting poison, but they may assist, as under any combinations of sedatives, specifics, or simple alkaline bromides and iodides, or veronal, antipyrin, exalgin, and the narcotics.

THE TIED PERINEAL BANDAGE.



My TIED PERINEAL BANDAGE can be used for the purpose of mechanical pressure. Used principally for perineal pressure or dressings, it also cuts off most irritations. It differs from the ordinary T bandage in the improved point that it can exert and increase the pressure strength by four tapes. The *Tied Perineal Bandage* was brought out by me in 1895-6; and it was subsequently shown before a local meeting of the British Medical Association.

Description.

Any convenient material can be used in its construction: soft French linen was first employed in Paris, and also in London, with a double-ply and bound. The belly or transverse limb fixes securely round the pelvis in front by using three forward tags, which fasten into corresponding white metal buckles. This abdominal limb is 9 in. wide; whilst the vertical or perineal limb should be about $7\frac{1}{2}$ in. broad. Both these points increase its strength over the old T bandage. The perineal limb, in wear, extends from the centre of the back, passes over the perineum, between the thighs, and then on to the abdomen, goes first under and returning over the top and to the front of the broad transverse buckled band; and then its end must be tied by *the two side tapes over the perineum. The feature of the bandage rests on the essential straps or tapes;* and they may be used straight or crossed, and giving plenty of pressure. When a strap and buckle is sometimes used it is not quite so comfortable. The two front tapes come from the corners of the reverse piece; and the two back tapes start from the bottom back and middle quarter of the back band. With regard to pressing the penis down, to cut off irritations, the tapes are tied on

each side of the penis when curled up and placed so that the bandage presses on the dorsum. That, obviously, must definitely prevent much of the two-fold, afferent and added, reflexures, and consequently of the normal or pathological erections, and always due to this multiple reflexure system. The bandage, also, efficiently serves to exert great pressure about the perineum, as over the testicles; or it may be usefully employed against piles, or for any tissue laxity, as in early predisposition to procidentia.

FIRST LOOP.

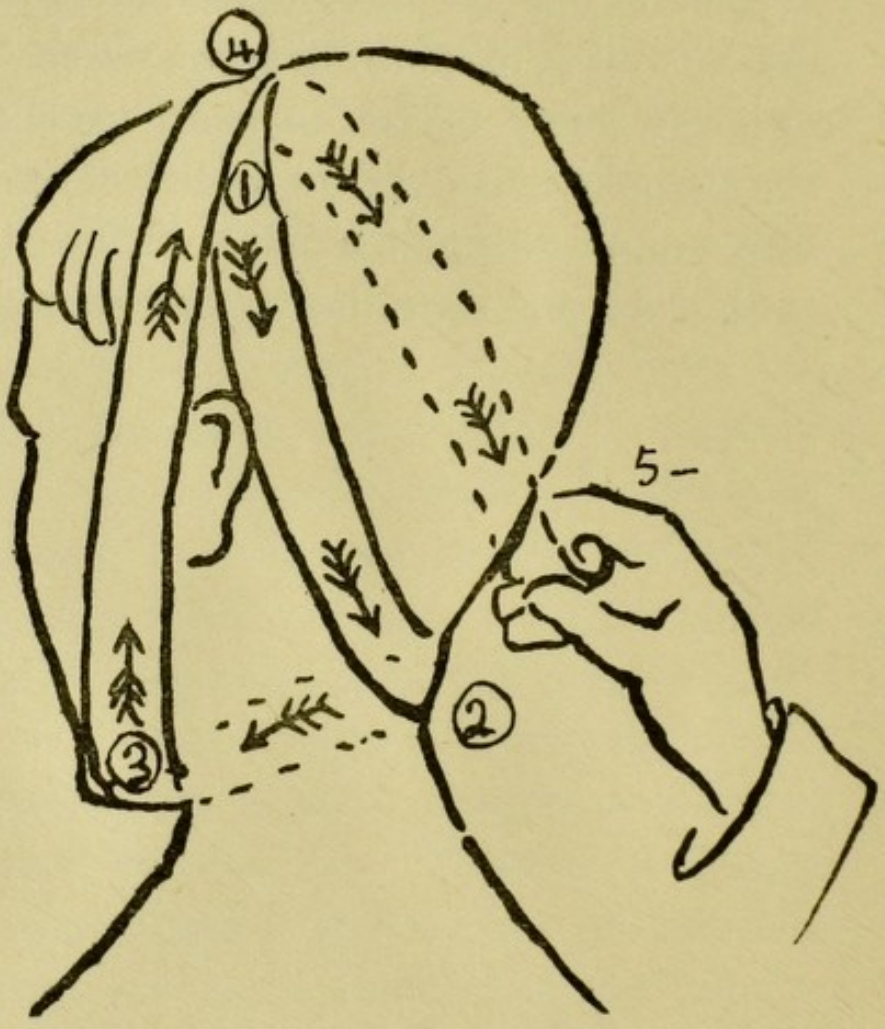


FIG. 1.

THE DOUBLE-LOOPED BANDAGE, A NEW HEAD AND NECK BANDAGE.

The advantage of a simple and easy and a distinctly set bandage for the head and neck is my excuse for bringing forward and describing this one. Place the end of the bandage on the vertex [the end may be held by the left hand and start on a dressing over the right temporal region, or other part, then to vertex], let it pass down obliquely to the left side of the head behind the left ear to below the occiput; continue it round the *right* half of the neck and obliquely under the chin to the outside of the left ramus of the jaw; thence carry the bandage obliquely up the left side of the face, in front of the left ear, to meet and overlie the initial end. This makes the first loop. The second loop is formed in the same way but on the other side. Thus, starting at the vertex the bandage is continued slantingly down the back part of the head, behind the right ear, to below the occiput, and after crossing the first loop there it passes round the *left* side of the neck, crosses the first loop again under the chin, and reaches the outside of the right ramus of the jaw; it is then carried obliquely up the right side of the face in front of the right ear to the vertex. This completes the second

SECOND LOOP.

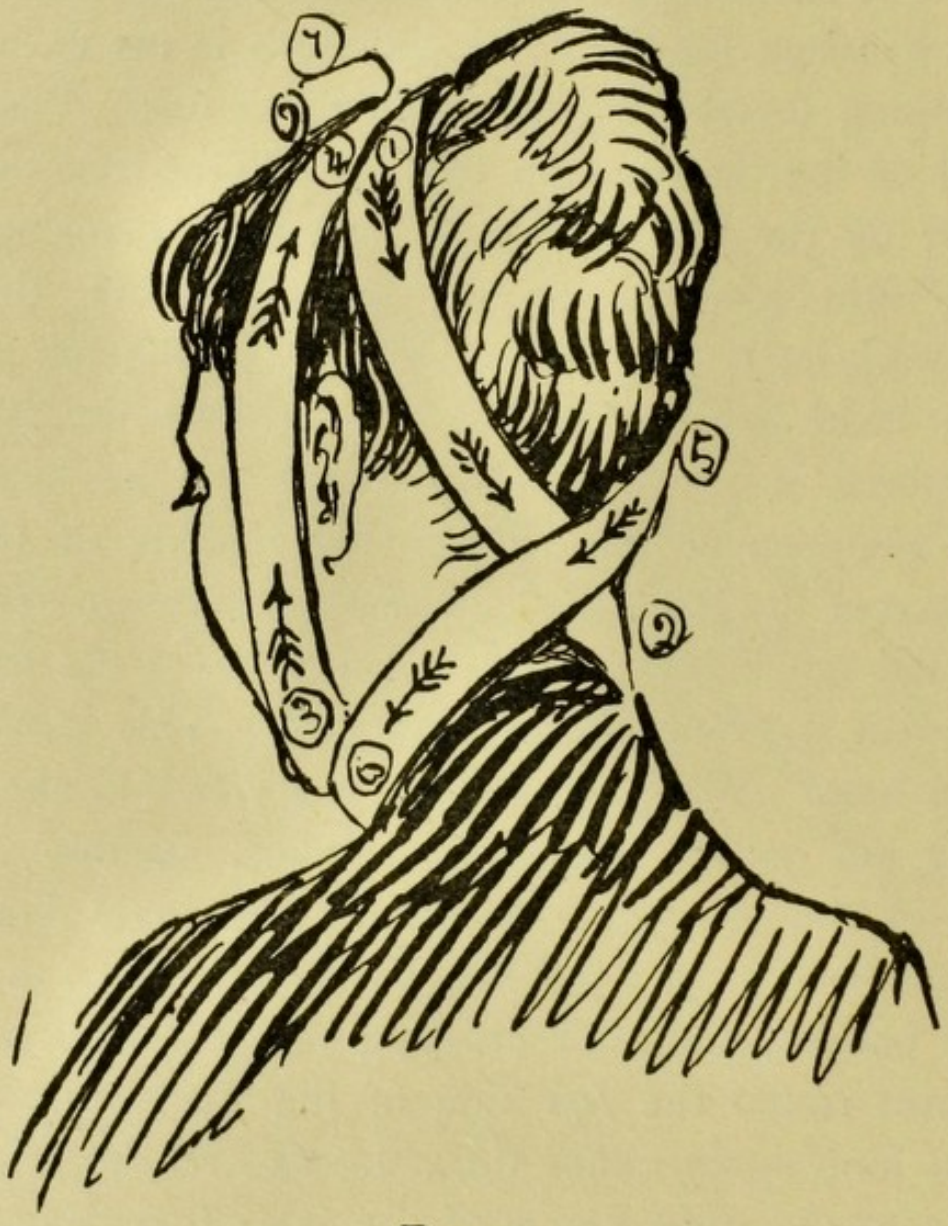


FIG. 2.

loop and finishes the bandage. (See figs. 1, 2, and 3, by R.D. in Exchg.). The turns are repeated to cover any dressings.

The bandage is convenient and its method of adjustment is easy to remember. It is self-fixing, so the constant nipping up with pins is unnecessary. It avoids any circumferential turn round the neck, and is therefore particularly comfortable for children. With this bandage it is quite feasible to keep dressings on for a week and more at a time without alteration, loosening, rubbing, or chafing of importance. It is the only bandage that permits of feeding without displacement.

As a definite base to start from, extensions of the bandage can be made as they may occur to anyone, so as to cover over any extra dressings, such, for instance, as under the opposite axillæ to cover the lower part of the nape of the neck, &c. ; or to extend to both axillæ to keep wounds of the neck (intentional or not) fixed. It should be pointed out that the double loops are not simple figures of eight, because they cross and turn three times.

Objections answered.—Unlike Barton's figure of eight bandage, it relies on two loops. Unlike Gibson's bandage, it does not cross the chin, but goes under the jaw. When once learnt, it can be begun on any site.

COMPLETE BANDAGE.

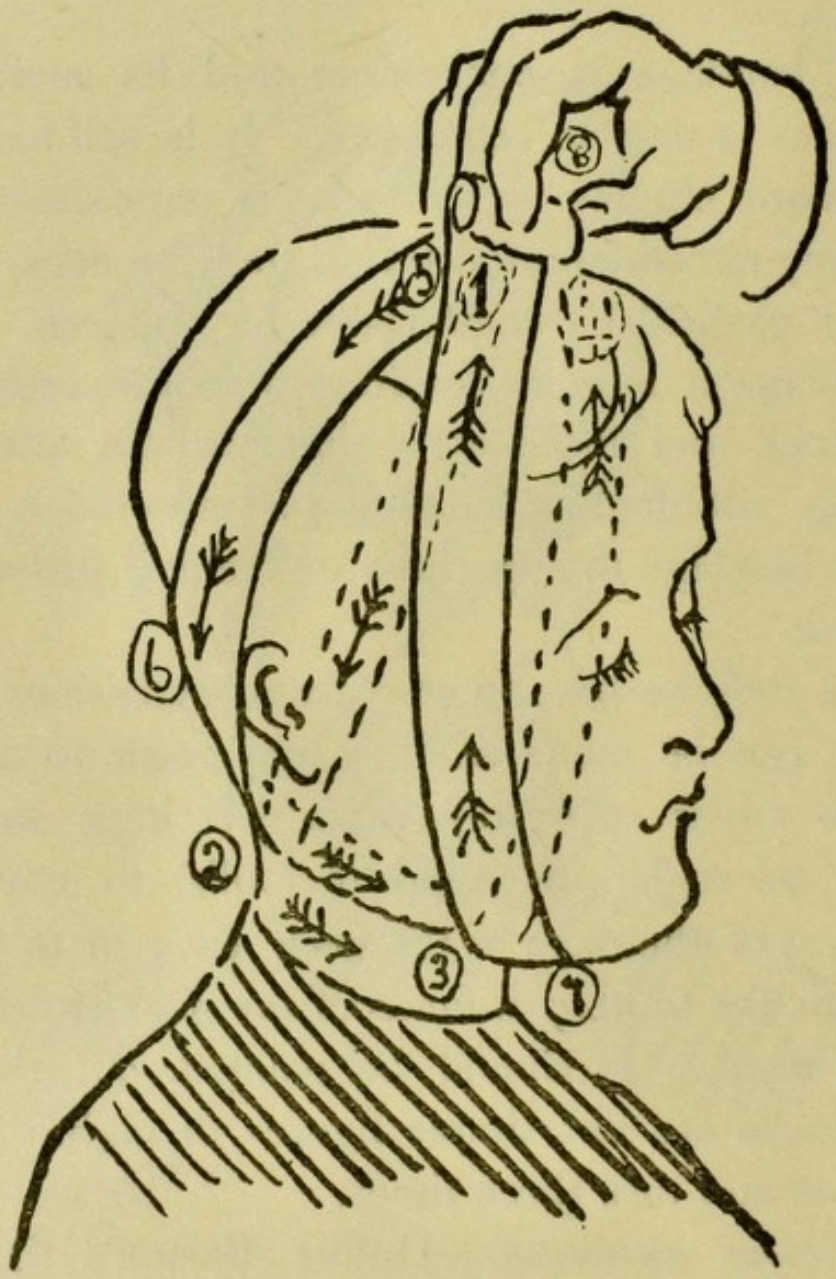


FIG. 3.

on a dressing on the face, on head, on the ear, or on neck. It is the best bandage to learn for this region.

> It will always remain the best fixing bandage. It surpasses all other bandages for feeding and permitting movements of the mandible.

Neck Fixing Extension.

After completing the bandage, continue from the back of occiput round opposite neck to the axilla, entering (*a*) the front and circling the shoulder, and so slightly compressing vessels, and making a cross on the neck, under the chin to the opposite side of face, &c. Or (*b*) entering the back of axilla round thorax, crossing the front of the neck to opposite angle of jaw, thence to vertex. These can be repeated through the opposite axillæ. Any similar extensions can be added.

As a Stump Bandage.

The bandage is equally unrivalled for half-circling a *Stump*. It exerts pressure ; and it does not interfere with the circulation.

The Bandage.—For demonstration, the fist should be held upclosed. Commencing with the end of the bandage on the top, it descends one side and half circles the other side of the wrist, and then back to the top; then down the other side, half circling the opposite side of wrist, and returning to the top; and that completes and fixes the bandage. Repeat as often as necessary.

To fix it still better, and yet avoid circling the wrist or limb (and arteries), the half circle can be carried round three-quarter circle, and come thence to the top; a repetition three-quarter circle on the next loop of course bringing it straight again. Following the indication of relief to pressure on the arteries, the rest of the limb can be fairly covered by plain spirals up and down the limb.

AN IMPROVED SKEIN TRUSS.

DIAGRAM.

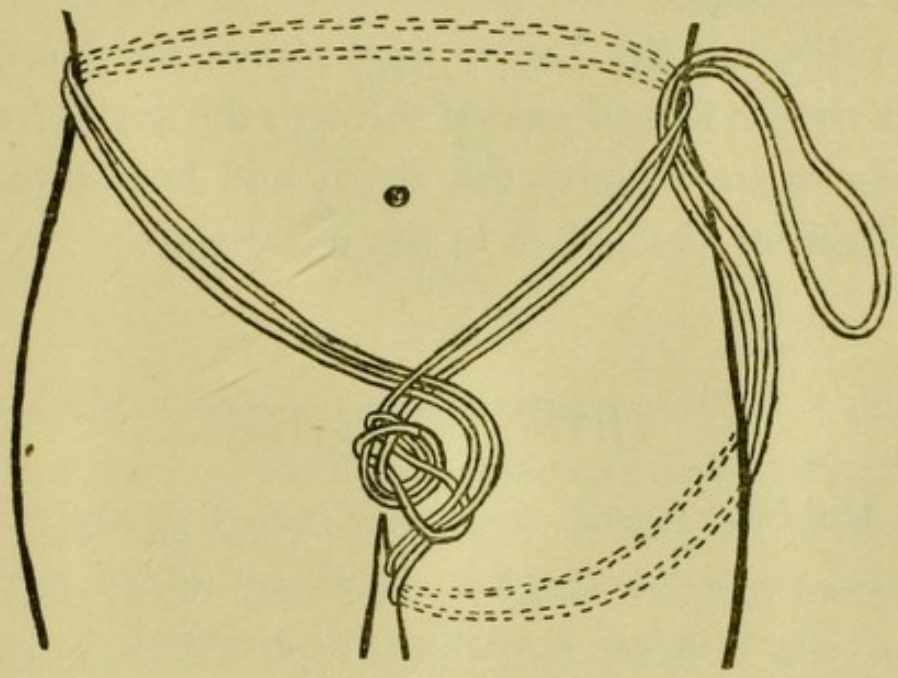


Diagram showing Mode of Application of Woollen Truss.
In practice the knots and eye-loop are tightened up.

The knotted skein truss, as shown in the Diagram, I have found more reliable and safer to keep a hernia up than the ordinary wool one. In its design there are these two special points. A single knot is tied on one end of the two-strand skein; this is used as a pad over the hernial opening. The second point is, that in tying the knot a small eye-loop is left below the

knot, and this loop grips the other end of the skein as it passes through it. It is applied differently from the ordinary one. The skein is placed round the pelvis, but the shorter end, with the knot, is over the hernia, and the longer end passes over to the hernial side, goes through the larger loop above the knot, thence over the knot, and passes through the smaller eye-loop finally to turn round the thigh and be fastened off at the brim of the pelvis in the usual way.

NASAL DILATORS.

(*My Instruments have been copied by others; but those examined by me do not adjust nor dilate so well as the originals.*)

The Nasal Dilators in the forms represented serve the purpose of supporting and widening the resting state of the nasal orifices, and they act better than the obviously interminable fittings of fixed props. If two of these dilators be placed, one in each aperture of the nose, they give a good increased breathing space. They are made of silver, so they claim the advantage of being slightly adjustable by carefully stretching or diminishing their sizes as thought suitable. The

sizes depicted are medium sizes, but small and large boundary ones can be added. They can all be applied as ordinary specula, and as specula the small "double blades dilator" and the "saddle dilator" may become readily adaptable to cheap aseptic uses for separate patients.

FIG. 1.

The double blades dilator for the nose (fig. 1) should be lightly stretched to the size wanted, and inserted by entering and engaging the blades in the nasal orifice, of one side, with their free points; then, by pressing the knobs towards and under the point of the nose, they slide into place entirely within the orifice, dilating that side of the nose; one blade rests on the septum and the other on the inner surface of the ala. The knobs may be shaped flat or biconical, and give a hold for the instrument to be extracted by.

The nasal saddle dilator (fig. 2) was constructed for easier manipulation and somewhat stronger service, but it is not quite so adjustable as the others. To introduce it, the free level end abuts on the lowest

part of the septum, and by moving the knob of the handle outwards and upwards, the bow of the saddle glides under and dilates the ala nasi and rima naris of that side. The increased curve, or the shoulder

FIG. 2.

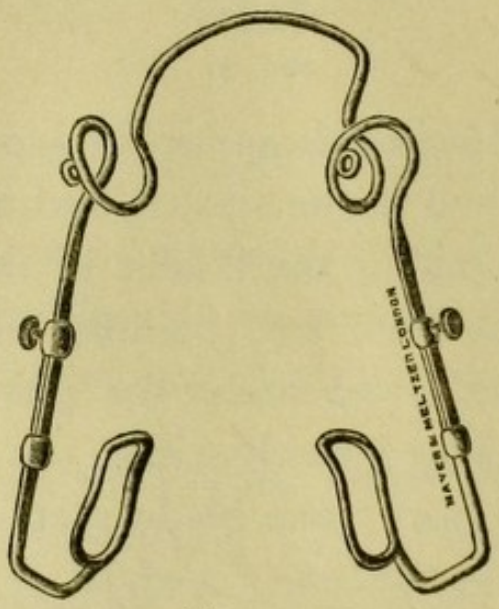


FIG. 3.

on the outer side of the bow, helps to retain the instrument within the nose.

The over-nose speculum (fig. 3) was brought out as a single bow spring, 1904-5, and briefly described

in the *British Medical Journal* of October 7, 1905. It was immediately copied by others.

But more adjustable sliding and curled arms have now been fitted. The top spring arch is made of silver, and this can therefore, without rough handling, be stretched to the strength of the spring that may be required. The method of insertion, with the arch on the bridge of the nose, and the blades dilating both sides, will be discernible without further explanation. The eyelet holes hold the knots of a round elastic, to be threaded and passed behind the head so as to fix and keep the instrument *in situ*, making it available, when wanted, for operating, or at night. A necessary direction for keeping the blades in for the over-nose speculum is to adjust or twist the lower borders of the blades outwards in the direction of the natural lines of the sides of the nostrils. To help in this the facings of the sliding shafts have both been made to look slightly upwards.

As previously described, *in an emergency* the fingers, or two pens, can dilate the nostrils. Of the imitations that arose, they still seem to me not so good as the original ones.

These dilators would appear to me to be of use in general application, and of aid for the temporary

relief of nasal and cardiac asthma[1] in cases with restricted nose space; for nasal breathing difficulties, for colds, in rapid transit, &c.; or on the hard and last fatiguing stretches whilst climbing the highest mountains; or in insomnia, where a little freer nasal breathing efficiently makes for sleep; and also sometimes in pneumonia. They do not compete with oxygen cylinders or bags. But in most instances the length of time available, the *natural* oxygen intake, their ease, and the increase of the main air-track give these instruments their immeasurable advantage.

Of Use in a Stuffy Room.

In spite of Professor Hill's recent lecture, vitiated air can hardly be, or be worth being, improved by a fan, whether by a lady's fan or an electric punkah. In a stuffy room it does not do away with the necessity for hygienic ventilation. With more ventilation more

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[1] The term *Cardiac Asthma* not only refers to the classic asthma attack with cardiac difficulty, but those toxic cases after over-indulgence which seem to depend on a uric acid or toxic onset of asthma and cardiac distress. It was a loose term, no doubt, but asthma itself is not very precise, and the distress covers both regions, and by increasing the *natural* oxygenating powers and the natural inlet of natural air, relief may be obtained.

oxygen can be breathed, and still more directly whilst wearing my nasal dilators.

To Apply Medicaments :

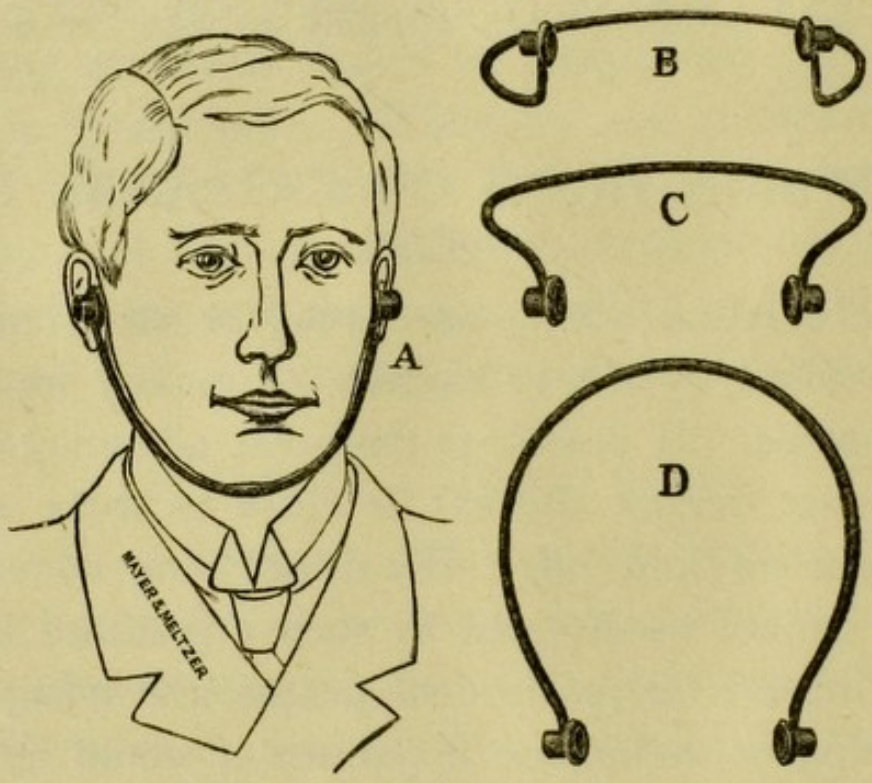
Small linen or lint bags can be tied round the blades, and medicaments applied outside, or on wool pads inside.

A TRAGUS TRUSS OR EXTERNAL EAR PRESS.

The external spring ear press, or ear truss, has been devised by me to exclude or modify moderate noise sounds. It possesses the great advantages that it does not disturb the ear, is clean to wear, and is easily put on and off. Great or bone convection sounds cannot be stopped by such a pressure instrument ; indeed, for partly deaf people and using bone conduction or audiphone apparatus it would improve the effect through intercepting extraneous sounds. The spring ear press, therefore, should be used chiefly as an indoor instrument, and in conjunction with double or closed windows or any other quietening aids. The range of relief in this way from many disturbing sounds will be considerable. If used out of doors it will still account for at least the shutting off of distant noises, but not for all close noises. It will

also be useful for producing sleep, especially when slight noises distract susceptible people and cause them to suffer in so exhausting a way. It sometimes

THE TRAGUS OR EAR PRESS.



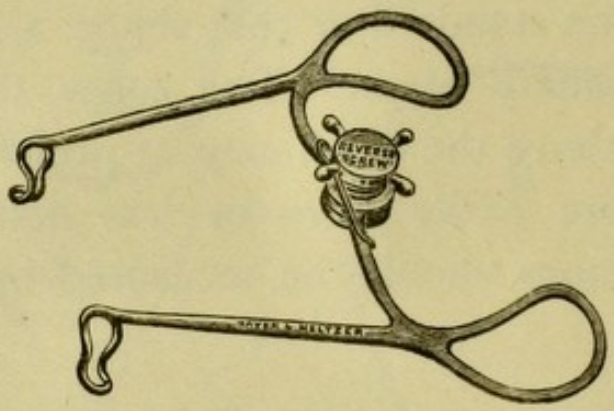
stops the whirring noise of arterial high tension, in its turn partly a product of noise strain through afferent and tension results.[1] Such noise becomes intolerable

[1] This referred to the tonic impulses conveyed to the arterial coats through the vaso-constrictor system, and which has not been sufficiently recognized. Noises, as well as worry, anxieties, and strains, thus convey their influence, and up till now have been un-defined under the heading of "high life," "high pressure living," "tension," and "nerves," or "supra-renal" excitation.

on laying the ear to the pillow or placing the head in any resting and dependent position. To wear the spring ear press, the bow, which is rubber covered, fits under the chin in the case of the Standard pattern A; behind the neck and below the ear in pattern B; or behind the head and above the ear in pattern C; and above the head in pattern D; the pads press on the tragus over each external meatus of the ears, and by pressure the spring and pads close the ear-conducting by-ways. The standard or chin shape, A, can be made in three ordinary sizes. The other three shapes, behind and above the head, may be preferred by some as being more easily worn or less noticeable; but these latter ones should be measured or fitted from ear to ear.

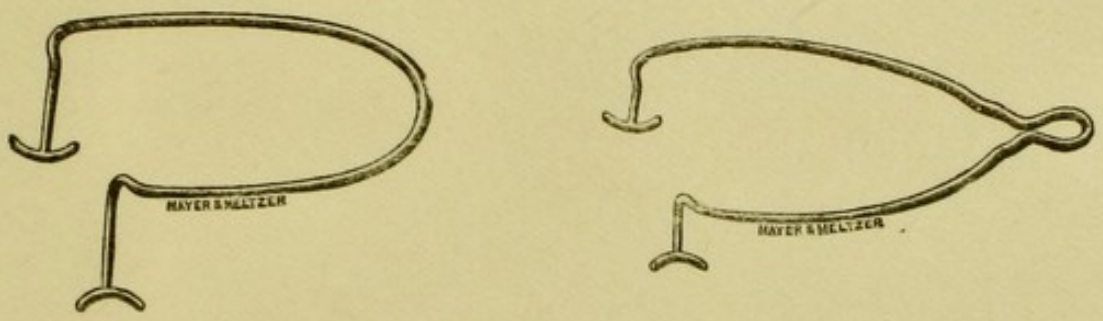
RETRACTORS FOR MINOR SURGERY WOUNDS.

RETRACTOR FORCEPS.



The *Retractor Forceps* owes its efficacy to two points: the eccentric arms, which increase the working gap or degree of excursion, and the pivot, provided with a reverse screw, which stops the inward thrust of the arms when extending the sides of the wound. The handles have been formed kidney shape to give a better hold at all angles, and on full extension they fit and overlap to occupy less space.

RETRACTOR PRONGS.



The *Wound Retractor Prongs* have been constructed with a U- or V-shaped spring, and have been designed for self-retention and quick dilatation in wounds in minor surgery, and as an independent help to keep the unnecessary fingers of the assistant outside the wound. The prongs at the wound ends have a half-moon shape, the tips being slightly sharpened, and this arrangement admits of an increased hold upon the sides without doing damage. Both the elbow and the thickening at the back strengthen the resilience of the springs, especially when made of silver. The silver construction in my instruments when in the presence of a wound electrolyte probably enhances a cleaner and an antiseptic quality.

IMPROVED DESIGNS.

Anyone interested, or who requires them, and will pay the expenses of bringing out a few other new forms and designs in instruments, should write to the author direct.

TO INTRODUCE BIO-MOULDINGS.

BIO-MOULDINGS.

A Natural Law in Activity and Degeneration.

FOREWORD.

Bio-Moulding has its own character; and it claims future inquiry as a special branch. It does not relegate living plasm (models) to the chemist, for C. H. O. N. S. P. or Colloids, as most physiologists have done. It rather joins bio-chemistry to bio-physics; but going a great deal further. It examines the subject of the Centrosome. It realizes the existence of formative conditions—not as a dead-like chemical unit of life, but as a moulding or *Unit Process*. It splits the complex cell into the (more dead) chemical or somatic part, and the (more living) attracting, catalytic, amœboid nucleus, and very likely go-betweens or cellular plastids (especially in plants) surrounding the nucleus. It specifically recognizes surrounding accretive and many other forces. The nucleus of a cell does not preside over, but lives upon the accidental moulding or food provision of the bio-plasm.

As a resulting direction, it would cover numerous inquiries, as: Critical temperatures, Critical moistures, and my habitat or elective bed media for living organs and cells. The latter, like the old serum, or my new skin and other emulsions, and sub-cuticular plant emulsions would, I have held for twenty years, be best preserved on a glass-meshed bed; but, of course, excluding Ross' and Crapper's more recent osmotic and only disorganizing gelatine films.

Enow things said—except that *dead chemical* Ittnerite, as well as colloids, forms jelly in water.

Gravitation as the sole basis of matter must be broken with. It is a measuring mark or sign only —no actual base. To re-test and re-start a new basis for matter it will be necessary, whilst not disputing the regularity and the mathematics of the old laws, to formulate and begin to re-cast new ones. It is to be suggested, now, that there does exist something *in* matter beyond mathematics—an outward diffusing substance to the atoms, or ENS, part of the working condition or BIO-MOULDING, and existing between the atomic structure. Ancient and modern writers never went beyond Newton's corpuscular or Galton's atomic formation or concept. Faraday's ionic pieces seem to me only part of the association.

Upon it will be founded the general laws occupying the mutations and workings of all substances and organizations, down to, and from, their molecular and even atomic structure,[1] and governing their forms. Certain natural laws, from their associated interdependence, will forthwith be announced, and serve to introduce the consideration of this subject.

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[1] *I.e.*, "Property"—not Epicurean or present-day Varying atom Structure.

THE FIRST LAW (I) OF CONSTANT ACTIVITY shows a constant power of expansion, and a corresponding power of contraction in matter. [Our present conception of the constant atom could not answer to that test.] There must be both atoms or ionic pieces—*plus* Atomic Structure. It, therefore, refers to an alternative matter, the inter-acting-ENS. This constant activity serves, from the lowest to the highest organization.[1] It opens up a broader and more definite groundwork than the prevalent idea of a single atomic vibration, and dips into a universal working composition, quite apart from artificial calculus and high mathematics, the formulary of which could equally

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[1] Nature never works contrary to herself! Activity marks an inexorable interchange, and ramifies into every corner of recurring actions or reactions in the universe; from the beginning right up traced to social activity; and reflected in all planes of thoughts; and cropping out even in activated and opinionated leadership. [But with Bio-Genesis the old beginnings do not recur, only new ones can; which shows the great falsity of Dr. Bastian's spontaneous generation.]

Sociologically true, may not this necessity for Constant Activity justify the instance and the correctness of the old store of so-called Vandalism, such as that of the Alexandrian and Turkish and Mahomedan fanatics, and the bigotry of the Mexican Jesuits, and other instances where wholesale destruction of Egyptian, Gospel, or Aztec records took place, with the irresistible excuse for some yearning for the *new?* Deplored by

slavishly deal with any prescribed supposition. It need not admit, nor does it rely upon, the Brownian movement, lately said to prove the atomic movements, but which may not be always visible; and certainly it cannot be structural. When heat or the vapour given off by an animal, or any other form of matter, passes away to a contiguous body, that activity (*really associated activity*) of the atoms does not disappear; so that something—or ENS—must be associated with that phenomenon. On another hand, this pointing and binding substance readily accounts for variety, or dispersion, or diffusion in Gases and Solids and Dissociations, and which the theories of Arrhenius and Van't Hoff only partly

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some, yet little blame can be attached when regarded as removing ancient and remote types—that is, in reference to masses of dead, undeveloped and past thoughts. It has relieved the totally unnecessary brain-crush of exhausted works. Who doubts that the sceptres of advance rule should rule, with a train for fresher reverence and fresher mouldings, and receding more and more from the narrower sight of things unsatisfied by the past selfishness, or business, or other monstrous routine images of any age? Old trades, traces, records, and epitomes might be left in museums, and might or might not interest the less busy espousal inquirer, if not already too loaded; and preserving sufficient to satisfy the delving propensity and recreative enjoyment of archæologists. But no more than that, with that subject.

clear up. It would do away with the idea of liquid, as water, and substitute a true concept, seeing it as a more viscid or closer texture than gas ; and, in the case of solids, through every gradation from looser to firmer, or from wider to more attracted forms, by the nature of the attractive action of ENS.[1]

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[1] PHYSICAL PRESSURE AND FRACTURE AS DETECTORS OF INTER-ENS.

Instances of the property of ENS may be traced in fluids (Water), or gas (Air), or even light through an extension of the Newtonian corpuscular transmission. If a light curtain, drapery, or silk sheet hangs in a room, a hand or door moving will press and disturb them. The atoms may be in equilibrium, but that corpuscular pressure is effected through the freer part of ENS surrounding the atoms. Seismic waves travel round the world, not by atoms, but through this binding material—INTER-ENS vapour. The meaningless terms of Kinetic power, or dynamic potential, or other mechanical mathematics are thus transformed into an entity or the conception of a definite material. The present empirical "energy" for chemical equations, or plotted curves of critical temperatures and the premises of Gibbs' Phases represent observation only—the rules underlying the fundamental avidity of ENS shows the way to explanations. A person blows a candle out with his hand or mouth. The corpuscular atoms would be no hindrance, the better explanation being that he drives the sufficient amount of ENS and heat substance away by fracture, or forced pressure disturbance. Hard pressure, hammering, or fracture ruptures the ENS cement, not the atoms (atoms do not split!) Atoms do not act in all directions! But ENS as a constant to all atoms is the proposed and convenient

medium that does do so, and it certainly responds regularly to the laws of pressure—and practically in Brahm's Press, air gun and other explosions, and with the numerous Pressure Laws, &c. Flower activity often ends in scents; and their pressures press in a chemical degree, on the Schneiderian nerve endings. According to Shäfer, in humans and plants, shaking alone contracts the contractile cells; there some mobile material, as ENS, can alone press or break into the new or altered combination—and readjust the simpler transmutation of atoms (Ramsay).

In *Colours*—If Atoms do not alter, why do the Colours alter? It may be concentration! As O_2 and O_3, or (and) the denseness of the crystal faces stops the light refraction or Ray penetration. So much for every colour.

In *Electricity*—The setting of ENS sets the atomic SPACES loosely (as Copper) or tightly (as Sulphur) so as to permit, or prevent, Electricity (gas) passing through! That explains a difficult subject. The escape of interatomic Ens with some Electricity along ductile wires would engage a partial interatomic vacuum, and thus explain electric pressure and discharge.

In *Chemical Mass Action.*—Any reversible action, as with Ammonium Chloride and heat $\left[NH_4CL \underset{\text{Cooling}}{\overset{\text{Heating}}{\rightleftharpoons}} NH_3 + HCl.\right]$ there must be something more than the interchange of Atoms. That constant relation must be ENS relation. The latent heat is only variable according to the quantity in a Solid or Vaporous State. The *Constancy* of HEAT with ENS should be regarded in the atomic structure; and it can be worked out as 6·0 to 6·5 of specific or rather atomic heat in the corresponding atomic weight. (Dulong and Petit's formula.)

In *Chemistry*—ENS, by attraction or pressure, forms an indifferent and plastic material, in specific quantities for all Atoms, and with an appropriate or respective constant concentration for Solid, Liquid, or Gas Phases. (Avogadro's "*proportion*"!)

In *Chemistry*—ENS pressure is increased and expanded by

the forcing in of Heat Substance in sufficient quantity. Then, *if a metal bar be heated*, and the atoms or whirl-buds likened to billiard balls, the pressure of ENS, *plus* Heat Substance, and *plus* the Atoms, all spread. Some of the end or freed atom-balls would be knocked off into other neighbouring combinations. The ENS and Heat Substance diffusing or going still quicker, would heat and expand the metal bar higher up, and some would escape into neighbouring combinations (Radiation).

Some ENS is always evaporating at the surfaces of the atom-buds, and so explains the start of contiguous chemical action, holding of metals, spread of active fire, the break and spark of the flint lock, and dry wood sparking. *The tie of ENS thus bursts, and the escaping ENS liberates heat and the other rays or constituents of the Atom Bud.*

In the Tropics, the increased joint-pressure of ENS and Heat Substance determines the greater natural cell growths and vegetation; and so typical of the present and past ages of tropical luxuriance. *That covers a wide field of formerly and otherwise difficult explanations.*

Then, outside Ether will comprise attenuated Elements +ENS—which attracts or suspends the Stellar system.

NOTE ON INTER-ENS AVIDITY.

According to Faraday the attraction of chlorine water and gold or other combine may be accounted for as an attraction between base and acid ions.

A constant tension exchange with a gradual surface evaporation of ENS, I believe, shows the instability of matter, *not* the chemical and fixed stability. This provides for the first turn of catalysis, or enzyme action, or the start of every chemical combination. This phenomenon might now be known as ENS AVIDITY.

In my view, like in all chemical actions, it should be regarded as a splitting, with commencing and continuing INTER-ENS Avidity, always going on slightly, and as the cause of

dissociation in contiguous chemicals. Otherwise, why should cations or anions, or electric equilibrium (only two quantities) be disturbed ? The ordinary book explanations attributing chemical action to dynamic energy *plus* mathematics, or Gibbs' Phases to plotted curves for critical temperatures and pressures, may be due to observations; but the above readjustment of disturbed inter-ens outlines a primary and fundamental explanation.

Other Proofs of the Existence of an Inter-Ens.

If a fire be smouldering (or gases be placed nearly at flame temperature) a sudden rap or shock will break the nearly expanded inter-ens tie, and free this lighted substance into a flame. Inter-Ens being lighter than hydrogen always if possible ascends.

Joules' Rule was $h = r c^2$. It clearly demonstrates that some combination of heat exists. Naturally it seems to account for Inter-Ens as the inter-combining substance (the old potential) and where all chemicals contain it together with heat and electricity. (Ions, *if* they comprise anything, may or may not be active.) But it rather looks as if the ions were partly structural.

In Chemical Reactions.—Inter-Ens comes off easiest, or more readily from O_2 than from P_2 or S_2, and so on from the other elements in order. When sufficient Ens dissipates from any matter, the all-important kindling temperature or Ens temperature splits the nascent atoms, and they freely meet other atoms, cool, and combine again. In the case of P_2 burning in O_2 the congeries of atoms or element buds (or Kelvin's Atomic whirlings in Ether, if existent) liberate Ens (from O more freely), and the Ens has then a special affinity to draw together the other contiguous elemental parts, so the nascent P and O combine in affinity proportion, or constant proportion to form $P_2 O_5$; and the corresponding liberated Heat substance and electric gas also readjust themselves. Generally this active *liberational stage*

There must be co-related to this inter-ens conception of matter two other associated laws, to be added to a general New Science of Causation, or Bio-Mouldings, and helping to supply the principles of formation.

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of heat substance (so-called "Calories"), and inter-atomic unrest, with Ens readjustment, ends in the substitution of more stable or tighter, congealed conditions of Ens relation to the atoms; with less Ens, less flame substance, less electricity.

MATTER.

Under this System.—(A) Matter has not the former *one*, but *two*, or *three* or more characteristic conditions:—

Viz. (1) The *Character* Element—the atoms (of which we do not know the origin).

(2) The *Structure* Element, of which ENS is the foundation.

(3) There may also be the electric gas, and a Flame Substance or heat substance, and sometimes other rays.

(B) Matter has not the former *Inertia*, but CONSTANT ACTIVITY or unrest, itself belonging to a natural law of Moulding (*i.e.*, Structure), Ens being constantly liberated and freeing the elements or congeries buds.

(C) Instead of the older *Conservation* of Matter, it has here been proved that Ens establishes the MUTABILITY OF MATTER. The liberation of Ens being very perceptible in all combustion, especially in oxydations; and observed to be gradually liberated over æons of time in the case of hard rocks, or with, say, iridium. Ens, probably, is being rapidly liberated in the case of the compound Radium and allied bodies; with a corresponding dispersion of heat substance, also the compound Becquerel rays. Extra heat helps to expand ENS even in a refractory metal like Platinum—to allow of its combination with Fluorine (which has an easy liberation of ENS).

THE SECOND (II) LAW OF CONSTANT AFFINITY, as a primary and a corollary movement of (I); it stands for the first causative motion or attraction of matter. Apart from electric or ionic action the greater part of the AFFINITY depends on the *relative attractive and specific contracting amounts of Ens being due to each atom or molecule, and combining therewith.*

The last takes its place in a proportionate degree for the atoms and combinations; with Ens it takes a firmer and fixed, and in quantity the least, degree after a commencing affinity for every congeries of atoms; and to be observed in all chemical aggregations of atoms and their combinations.

A THIRD LAW (III) OF PARALLEL LIMITATION restrains the limits of II, covering the Bio-Moulding principles that govern the physical forms and varying dimensions in matter, and in all combined organic growths. This is the most interesting of all—because before now it was practically unthought of. No doubt the large question of osmotic pressures, and Surface Tension effects (Ramsay), opens one introduction to Physical limitation.

A FOURTH LAW (IV) OF DEGENERATION, as a gradual termination of the combining movement in matter, may be recognized beyond the

other primary and growing stages of activity. It constitutes an inevitable and constant natural law of defervescence, and follows No. III, after a time, whether in living or dead matter. It opposes the dead exclusiveness of the "conservation of energy," which must only be partly applicable, for it in no way suffices to answer that aspect of Nature.

The observation of all Natural Phenomena furnishes the proof of these laws, and especially where the objects of Nature grow. And to the workings and experience of Bio-Mouldings, in the future, we must look to supply every sequence in the chain. One may recognize the value of these observations, because they alone *precede* and *anticipate* the correction or readjustment of the old laws, and because they try to trace a step farther backwards towards origins.

If these Laws be accepted as a linked series, they upset the cruder static laws of rest, and the chemical and biological ones of balance, and the idea of the mutability of species. As above outlined they expostulate the unalterable docketing of each material conservation of energy, although it does not disregard the primary fixity of relative amounts of ENS within elements or some amount of fixed atomic structure. The introduction of these *Mobile Laws* stands for perpetual and gradual changes in Nature.

A large application to demonstrate this series of laws may be gathered from the shells in geological beds. And existing laws certainly do not help their solution, as the Mobile Laws do. They are entirely and eventually through the ages changed by the Law of interpermeability of atoms (I, Law of Activity), into a primary and fixed chemical unity or calcareous rock, through the stages of Defervescence. Probably the Ens floats and changes its attractions—therefore the Atoms do, like we know solids (iodine) float in the gases—. The law of "Mass-Effect" or the chemical changes in the Earth's crust—(as the carbon-dioxide action in the air on rocks) finds its best explanation here, with slightly escaping Ens at all surfaces to start chemical affinities. Likewise, vegetables and plants and seeds in Geological formation change or degenerate their atomic molecules by the Law of Defervescence (Law IV) into a combined primitive interchanged Carbonaceous, or lower atomic, Series. That cannot be explained by the older static process,[1] nor by the ordinary geological idea of simply superimposed pressure, which would do nothing.

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[1] STATIC LAWS of Nature probably do not exist. *NOTHING STAYS STILL*—IN RELATIVE PHILOSOPHY.

P. 186.—Note 1 *continued*:—

BASIS OF THE NAMED LAWS OF NATURE.

The origin of the management of Matter and the universal changes already indicated under the Laws of Nature (named) I believe devolve because of the interpretation announced in regard to ENS, as an interrelation of the internal structure of Matter based on ENS, and not hitherto realized as the bond of union. The escape of ENS at the surfaces, immeasurably less in the internal parts, constantly and minutely going on even between the tiny primitive congeries of Elements, gives rise to, and is the explanation of, the commencement of their associated chemical and physical properties. The result of this surface action of ENS, and the congelation in degrees, leads to Surface Tension—to surface Self Skins, and Cellular or Foreign Skins—to the physical Strain of Surfaces and similar phenomena — and those comprised under the IIIrd Law of Parallel Limitations—and it underlays the processes of bye-products, exhaustions, dryings, and the Law of Degenerations.

The Oxygen and Nitrogen of the air are kept in perpetual flux, free from their otherwise liability to promote firmer surface ENS avidity and to form more stable combinations, because of this wonderful provision of the perpetual renewals of ENS from the chemical activity and freeing of ENS from chemical bodies or parts all around, and, with the lightening and heat effects, maintaining the essential and beneficial gaseous state.

Also the Ether beyond, with its rarity of elements, probably largely consists of ENS; or its structure (whatever it is) assists in catching the ever rising stray and vast quantities of ENS from Planets and Suns, and it may thus act as a float, as well as a tie of attraction for our stellar constellations.

These constitute vast gathering explanations.

(*ENS = External Neutral Substance or Solvent.*)

Under the Mobile Laws it clears up this old phenomenon; the beds undergo the IVth law of Defervescence, they char or carbonize (or fall to their lowest atomic combination with ENS), under the influence of a gradual and constantly active disintegration.

Another all-embracing support can be tested with alcohol. Alcohol should be taken as a type of a borderland drug, partly a food, then a drug, and finally a poison. Consequently the first two promote Activity, the last Defervescence. Also, it would not be difficult to treat alcohol so as to make it a convenient experiment on a laboratory living subject, more especially upon the extra reactive infusoria, with their rapidly dividing *perpetual germs* (*i.e.*, perpetual according to their surroundings to be hereafter described). If the alcohol were to be given to the organ or the germ and in the *smallest sufficiency*, and so approximating to its proper food elements, the adjustable or infusorial bio-plasmic corrections, slightly extended from the normal range of activity, would be indetectable, the germ would, therefore, be unaffected. But if any chemical (here, Alcohol) were to be given in *excess*, and beyond the power of correction or elimination or combination, then it would blend

or entail serious alteration by selection, and change the plasm to a more *fixed* defervescence of the bio-plasmic molecules. There, the first (I) limit of natural activity would be past, and the range of progression would follow into Defervescence (IV) or altered structure. The loss of activity would continue to and end in the fourth law of Degeneration.

Development.

Another, perhaps the best, test to examine this subject upon will be elucidation gained from the Development of animals. It has long been held that Nature (according to the thousands of named forms) responds to the prime factor of Environment, that is, by *local* surroundings only for every Species. Under the Series of Mobile Laws, it points backwards more remotely to antecedent activity settling upon the influences tending to earlier variations; that holds up a truer mirror to Nature than the other too distant observation of local environment. Thus, broadly taken, and always in Nature, the true influences always spread through minute activity and constructive variation, guarded by many unknown Laws of Restraint (III), and a gradual end stage finally

setting mobility back again to end in the Law of Degeneration.

Darwin's colossal generalization owed a considerable part of its origin, as it seemed to me (*vide British Medical Journal*, 1905, December 30), from the appearance, observed first during his early voyage, of the various colours and conditions affecting the stock and differentiated genera of otherwise similar *edible fungi*, and occurring over the South Seas littorals and lands. His genius, like most genius, extends from such a fine strand or nerve thought, that it beckons to its aid the fruitful chances of stray notings.

Therefore, genius itself, following the above laws, and like all else, trains and grows. And, against the general opinion, it cannot be reared and counterfeited.

Darwin immediately located his observed conditions as variations. But he only treated them, at that undoubtedly wonderfully early time, with *one* surrounding effect—*local environment*. In the newer view, expressed above, this will have to be receded from, from his primary influence; and his local environment by preference will have to be looked upon as *distant environment*.

Now, with the mobile laws, the two new over-

riding Laws of Constant Activity and Degeneration here crop up as a further set-back, and a different influence as to conditions to that which Darwin chiefly insisted upon. The early focus of Nature differs with the forces of Nature constantly at work and varying. In Species the greater early influence resides in the definitive, recurrent, primary, and antecedental Focal Habitat; and seen even in the human body influences (*vide* Vol. I, p. 88). If so, species cannot be due solely to the older view of environmental or *distant environmental* habit. Species cannot be due to both. The local or *distant* environmental influence ought to be taken to be secondary and, later, essentially of a shifting character. Whereas the primary part of Bio-Moulding belongs to the primary focal stage and which must be central and *recurrent*—so long as the stage or age lasts. This latter effect may be defined as a Focal Habitat in Bio-Moulding; it should never alter within the limits of that particular pro-creation or except for new pro-creations. Primary Bio-Moulding thus far depends upon such conditions as: (*a*) essential combining conditions, as for the atoms; (*b*) constant and minimum quantities; (*c*) a mobile, suitably nutritional *accretive* [II] factor of its own for that particular germ, or for that cell, or for that

whole organ. *Primordial Fixity* may vary; but the type or slightly changed *Prime Type* demands the recurrence of approximately similar conditions. That gives the introduction to the origin of the rise of Species.

Ordinary local or accidental environment has but a small influence, and only alters the subsequent shades of variations in Species, possibly producing Varieties, as in the above instanced colour oscillations in the changes of the essential Fungi. The same holds good in thousands of forms. Especially, it may be instanced, with the long and learnedly tabulated "Mimicries;" and which, probably, are not mimicry at all, but survivals after regular (*not exceptional*) mobile changes and degenerations. Local, distant, or *temporary* environment, therefore, applies to, or affects only character, traits, habits, and most varieties amongst Species. It does not account for the back or central origin of Species as Prime Types.

The germ difference of Species should be attributed to the focal habitat of Bio-Mouldings. After that, the individual Varieties, or even the smaller life traits, could then be classed under adaptations to environment. The latter, at will, can be changed any number of times. The stress laid by other observers

upon the larger importance attached to *local* environment has been because of its likelihood of frequent appearance. However, it would be a grave mistake not to recognize its damaging liability to accidental and irregular recurrence. Whilst the true bio-moulding, or primary bio-moulding, centres in a Focal Habitat, and acts as a strictly recurring type of influence, a perpetual recurrence that must not vary like environment. Again, it alone, and not the old environment, controls Heredity. Only the comparatively few and unimportant hereditary characters must be inbred, and they recur as a minimum. The influence, now as always, of a Focal Habitat derives its chief foundations from the Laws of Natural Activity and Degeneration. Of course, also leaving a germ survivorship as a remainder, *near that stage*.

Environmental, that is previous local influences may be taken to be a stage of the Law of Degeneration, and may combine so as to presage usual but dying habits in plants and animals.

Take local dryings in the cuticles: they are not formative, but degenerative dryings. Again, local cellular or tissue changes will mostly be due to local abundance or paucity of food. So, colour changes in the fungi and insects—the so-called mimicries—but

CORRIGENDA.

p. 37.—In note [1], *for* p. 109, *read* p. 59.

p. 155.—*Add* under headline,

[The ELLIOT-BLAKE BANDAGE was described and first published in *The Lancet* in 1902.]

p. 193.—To last line, *add* a reference note to "flowers themselves.[1]"

[1] POLLINATION.

Sprengel and Darwin showed that cross fertilization maintained, or rather strengthened, the Species. It had previously been practised under the ancient custom of fertilizing date palms and fig trees. Yet that assistance, like that of insects, in bi-sexual ensemination clearly must have been a late process, a late or alternative adaptation; and often not required at all. Cryptogamic and lowly forms of origin were self-fertilized; and their earlier differentiations, whether hermaphrodite, monœcious, or dicœcious in the florets amply fulfilled a primary simple, autogenous, self-fertilization by close, air, or dew-borne pollination.

VARIABILITY. [Due to the EXCESS LAW, (I).]

Species or Character arises by accident and moulding; and, in a secondary way, if suitable they adapt to the surroundings. The old idea of environment, as the primary influence, must be reversed; of course, in this instance, environment clearly is a Restraining Factor, (III).

more probably inveterate and *degenerative* fadings, with their associations—would not recur without the concurrent importance of light, colour, and habit-food opportunities.

Local or early decay, following the plastid storage, with their sun effects and drying, as in the local life-circle of the petals, also sufficiently accounts for the varying conditions and states of the environmental state of the flower colours. Such degenerative recession of the plastids (*not formative*), and as expected from the Law of Degeneration, comes at a time when the Sexual circle has been often completed, only excepting the less important ensemination. The previous preparation being automatic, the ensemination must be so too.

Thought follows sight, as in early observational science. It has, in the old mists, pretended and projected this external ensemination as due to live stock and diptera. Being so pretty, it gains ground as a novelist's wheeze or popular tale, but it is a wrong fairy tale, and only a "draw" for popular and paying pseudo-scientists, with their huge slave books and slavery to hackneyed notions.

The stable conditions can alone be found in the flowers themselves, and the automatic or flower

droppings must thus predominate, when the regular or irregular stage of ensemination takes place. The part played by Bees and other insects being only an additional mode and very slightly adapted in a few cases; and primordially it was not known. So the fantastical notion of colour attraction in the flowers, purposely developed to attract bees and flies, and serving to fertilize artificially, will be quite unnecessary, and too remote for ordinary ensemination and the rough and tumble of Survivals.[1]

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[1] Argument Backwards.

F. C. Bentham (1869) and Guppy (1906) support (in rather long books) the littoral transmission of seeds and their propagation. Bio-Mouldings train the arguments backwards. And surely, geological or primary effects, up to earth convulsions, and down to the lowly fish, also volcanic dust (Darwin), estuary silt, and altered channels, and antediluvians and insects must be accredited a much larger share in their various carrying capacities for the distribution of seed and fauna.

Again, with plant geography, Professor Schimper and H. P. Guppy recognize Xerophytes and Hydrophytes as organizations to provide against local conditions—the favourite observational and experimental view. The hard skin and thorns of desert areas was supposed to provide against excessive transpiration, &c., which is a purposive way of arguing forward; whereas, by arguing backwards to the cause, plants and other living structures cannot adapt themselves to surroundings at all. The surroundings themselves act *first;* and, in fact, force the production of

Many such influences of environment may be added to those above, and demonstrating only local influences, primary degenerations, sacrifices, and resistances, in plants or animals ; and then all assist in the alteration of *growing parts*, that is, for the Bio-Moulding of all the various tissue textures. The environmental bias then, partakes of the nature of intercurrent, but a later, effect ; and gives rise only to vicarious habits, or interparietal life characters. The mere cataloguing of ocular observations about environment, and the bestowal of erudite names to thousands of classes of Mimicries, can better be immediately curtailed and summed up, off-hand, as due to local accidents ; and well seen on the Pacific littorals as associational environments. The true test for these Fungi, and all other cases, such as the Flowering Peas, is, that they may, or may not, form colour mimicries to rocks or flies, &c., *but they certainly do vary in a dozen ways when placed in other non-recurring situations or places in the World.* So that they belong to environmental or variety influence ; and even there it

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the bio-mouldings or conditions and forms of the plants. As a proof, those plants under cultivation do not alter the germ ; therefore under those improved conditions thorn plants do not alter their character.

brings out a LAW OF RECURRENCE being the underlying feature in Nature's moulding of types. At base, however, there will always be found to be this important recurring minimum focal habit or food provision. It equally remains an influence for variety as for the Species. Only in that new light thrown on the double subject do we get a clearer insight to explain the geological change of world aspect and originating conditions for Species and Varieties according to the changes of geological periods.

GENIUS.

Another interesting question is about Genius. As inferred from the above, it should not be classed as hereditary at all, and so much insisted upon by Galton.

Genius, it will be seen, must be local, environmental, and due to these secondary or during-life considerations. In fact, the hereditary germ, or Focal Habitat, is a fixed quantity (except for improvement); and Genius is never fixed, but variant, always. Galton issued ponderous, recurrent tabulations, mistaken mathematics, and part observational facts only; but the mathematics were disproportionate or coincidental (as they generally appear to be, and statistics generally

vary), and mathematics can never be foundational; at any rate, not as explanations of the bio-mouldings of Nature. Mathematics, like Grammar, satisfy the narrow mind; but they describe no phenomenon—not even in the laborious and useless mathematics and averages of Eugenics. Lists of lawyers, poets, actors, scientific heads, potters, can all easily recur with considerable regularity and distinction, but with or without any reference to heredity; simply because of their being largely due to the forgotten family relationships, interests, and family and trade advantages and influences.

The stricter evanescent novelty of genius transcends most with newness. The enumerant or mathematical influences would then be partial. And, taking the category broadly, the only invariable factor about genius is the non-hereditary character. Its occurrence coming on top of the local proneness. It is dependent on accidental development and local training, however variable the hereditary basal endowment; and the subsequent bias will be an environmental bias.

After that environmental bias, as a corollary, the hereditary bias will lapse, because genius is quite incapable of passing on. Of course it may

seem to pass, but only as an incident as from a mere avocation to greater associations ; but it must be there strongly affected and pronounced through life's environment, and presided over by the other accompanying general habits. The different factor of sufficient Focal Habitat, that is, the minimum hereditary factor, only provides the primary activity, the primary control of the creature's life. *No real Genius ever begets Genius*, except as one of many fluke enumerations.

The old or short-sighted observational treatment of the subject of Development has centred mainly on the base of variation—instead of the far more important side of Bio-Mouldings and New Origins. Here, new origins have been considered as due to primary focal habitat differences as they occur, not to the previously held influence of "variation." The basal shades of differences in individuals belong to the influence of the series of recurring germinal (or nutritional) tendencies, and to the small first causative influences, in early development (not epigenetical). And they alone give rise to New Origins. In the subsequent or later part of full growth alone can there be allowed to be a preponderance of *variations*. And life's variations do not make Species, but only give rise to confusing genera or sub-types.

A PREDOMINANT INFLUENCE OVER THE MENDELIAN NUMBERS.[1]

THE MENDELIAN RATIO:—If this Focal Habitat distinction holds good, then the Mendelian Ratio would not apply to the origin of Species; it would only give rise to recessive varieties. The Mendelian theory only holds out as a *proportionate likelihood* of heredity; and must, in future, refer to passing traits or varieties only. With every Mendelian variety there is not an

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[1] These *Numbers* will here be called a *Ratio*.

Darwin's general deduction was drawn from a knowledge of preponderant characters amongst Species; he cared not a rap about the lower characters of descent. The recessions die out.

Mendel *followed* with the same results, merely observing *Pisum Sativum*, and showing the characters as dominant or recessive numbers in certain dominant proportions from male and female parents.

The *New Problem* set in this paper will be to discern what the active *Influence* has been dominating the character.

hereditary, but only a chance ratio, due to the issue and discretion of choice strains, and which is an accidental local environmental effect. This accounts for the chance numerical accord or variations :—often the base of long Pro-Mendelian, huge and learned but the least mattered articles and books ; not independent articles. They forget, or misjudge, the antecedent effects of the type experimented with, and the likelihood of atavism ; which latter, at least, proves there has been an absence of the minimum focal habitat requirements.

In developmental law, then, a marked primary Focal Habitat should be placed before these variable and incomplete variations. It will hold good towards all formative work in Nature.

It must override the usual and former environmental view of heredity ; for type heredity is never variable. In my view, it is only the subsequent *life* and easy observations that make it appear so. If heredity were variable, it would have to answer to variations according to innumerable local susceptibilities, such as soils, climates, continents, but which exert no influence on the germ (*e.g.*, Homo) except to a relative and negligible extent. That deals with the minimum *focal mean.* Of course, heredity may slightly alter

with local environment, as with abnormal paucity of food, or with extra severity of climatic or race surroundings ; but the local effect, or *extreme conditions*, will rather give rise to diminutions and abnormalities, and may be continued to traits, but not to minimum base type changes. Even the Japanese dwarf trees, or the dwarf Laplanders or African pigmies, can only be regarded as varieties, or rather suppression of the Types—a recession of the dominant. Even in the Giant or Diminutive races and types one can recognize the Arch Type or Prime Type. The primary movable activity or Focal Habitat never varies from the base type, that is, for the minimum conditions that must recur under the important main recurring conditions.

If the recurring conditions alter at any time it alters the species or type, and the old type fades—as from one geological age to another. That leads to, and, for the first time, accounts for the extinction of Species, the primary conditions having failed to recur.

In brief, the Bio-Moulding of the nucleus-form, in all Nature, responds only to a constant Focal Habitat ; and it acts with recurrent and sufficient minimum factors ; or with stores just sufficient to provide solely for the perpetual germ part formations.

As for the life apart, it counts for nothing, being only a subsequent and mostly an unconnected affair. *Life* (the part beyond the Germ formation) may be compared to a *Degenerating Sponge*—it has its fill (mostly water), is seen circling the hollow organs of use, and is then *squeezed out.*

The Study.

The law of Natural Activity, limited by Degenerations, should be well observed from the start, and all through the growth of all the creatures and plants around, from man to the chrysalides and algæ. As far back as the efflorescence of the bloom, and its fructition, it steadily continues through life to a wavering and wane, and then to an ultimate defervescence.

The key-note on either side of the Germ Line of each of these wonderful and hitherto inscrutable changes must be looked for in the above noticed Recurrent Law, the recurrent conditions, and which determine all the chief characters of growth.

LIFE GROWTH.

JUST to touch on the Sphinx's enigma, it really is still the problem of each age. But it has passed from the Priests' to the Doctors' craft and sacred care. The only way to attain this life, or rather perpetual long-life, would be to modify or stop the conditions that promote the law of defervescence. That would be an inexorable impossibility. We can, at best, but prolong parts: as by keeping to the easy circumstances of growth or youth as long as possible; or to insist on a Statute of more quiet from the greatest and most damaging abuse of, and the greatest curse of the age—"all noises" that hurt; and the more generous respect for quieter and more restful old age.

Unfortunately, all through the continued life-growths local environment has the greater effect—and the perpetual germs alone rest and live on and on—and on all those other sides it tends towards Defervescence and Degeneration [IV].

Life may all be conventionally checked, *at choice*:

according to the anthropological origin; or according to one's belief or exactions; or from the biblical story; or in a great survival of the soul and body division.

The Second Law of Constant Chemical Affinity leads up to each stage of growth right up to efflorescence. But each stage, and with its pabulum quantity to the strict amount, can only go on as far as permitted by the Law of Limitation. Under that huge range and variety of effects no such thing as another popular fallacy "co-ordination" could be met with or known to Nature. As here expressed Nature's laws must be Mobile. But Limitation premises a definite law of limitation for a variety of circumstances, not fixed "co-ordination." The degree of limitation marks a relative and accidental phenomenon towards each varying effect of the surroundings.

To this interesting feature of physiological growth to the full germinating power, and then, alas, normal degeneration, must be attributed the rise and wane of the everyday metamorphoses of sarcode or the protean changes of all cells. Although those actual Laws occupy the broad outline of a system of Bio-Mouldings, each stage will eventually have its full details, and much will have to be laboriously charted by futurity. One can only at first point out the Free Path.

The plumb-line fathom has here been reasoned and read, and it helps the first indications and line of thought and so to bring out inquiries towards the suggestive details. Certainly there ought to be, and there are, a regular series of these lower case chemical gradations right down to defervescence for all the cells. Fischer has begun to discern the first tracings of them, by showing the lower probable growth in an ascending order of the protean molecules from the peptonates; and he has split some of the zanthin or purin derivative groups into their descending order of amino-acid series. Really, that is a very small distance. And this new thesis has had to point to the wider directions, and has now drawn attention to the likelihood of an essential extension to the actual living alterations in the Cells, Tissues, and Fluids, physiologically speaking; to all the lower fixed changes themselves, as from the higher metamorphosis and deposits of all pabulum changes in the cells themselves; and to those of the lower Cartilage, or bone, or cloudy materials, with or without calcium salt activators, which belong to the natural series of what I call *Lower Case* Defervescence, each falling to a more permanent or a closer molecule. *These cellular stages can henceforth be referred to as Resting Cell Stages, being usually not imbonity to the host.*

And even Enzyme fermentation action, largely concerned in living and dead cell activity, likewise follows this fall into simpler constituents. According to Dr. Harden, he believes they may be caused by co-enzymes. I suggest that these latter, after all, may be exchange bodies, in the ordinary and liquid ENS way[1], with a recurrent molecule or activator from, and found in, the surrounding medium, and giving rise to bye-products, or to the contained simpler constituents. At least, it demarks a simpler explanation than co-enzymes.

BIO-MOULDINGS.

Bio-Moulding studies, not the physiological observations only, or the chance observations, or the analysis along the beaten tracks for re-research details, but the piecing together of the causes of life. It will build for itself a new science, and a special place of its own, to study the conditions of life formation occurring during, but chiefly previous, to those occupying

[1] There is probably always some free uncombined ENS floating that starts all chemical actions—even after being adjusted and fixed for the time being by any affinity close by.

physiology and embryology. It will only be possible to indicate the primary directions. One of the first will be to cement around it the physics which mould the molecules of the life cells; and back even to the perpetual cell mixtures of the germs; and the reasons for their occurrence. The bio-chemical basis of Protoplasm as the base of living cells, without the numerous other Chemical Gland Norms or reactions, is only another of the present-day fallacies of many physiologists. Bio-Moulding at once starts a new direction of thought in dealing with inorganic chemistry. In either case, the current consideration of the exceedingly important Third Law of Parallel Limitation may now be proceeded with for a little distance. Now, what conditions actually govern and restrain overaction perpetually going on in Nature under the Law of Activity and Constant Accretion? So far, little can be adduced of this neglected subject. But starting with this important recognition, those with laboratory facilities will now be able to carry it on on some of the indicated lines, or new laboratories will be usefully founded. As a beginning, it is sufficient to discern the two great forces at work side by side. In inorganic chemistry and physics, works are written on the abstruse mathematical angles, and

lengths, and their time of formations, so far only dealing with crystals, and catalytic crystallization, and colloids. But not a word transpires about the moulding factors. During these well-known certainties these new forces must be going on; and they probably embrace weight of flow of the atoms, the measurable surface tensions, the suggested pull or change of the E N S substance, however ethereal, or whatever the setting property, and a constant pressure under definite conditions, and, as a rule, differing as the surface and internal attraction ratios, but they all alter for each atom with its E N S potential.

Similar mouldings apply to the formative powers governing the allotropic relations of the faces of colloids and crystals and cell structures. And, no doubt, the large book-subject of osmosis also has some influence (but not the Laboratory figures) within the bounds of the First Mobile Law. Chemical Abstraction and appropriation from nascent, floating, and outside chemical food or bodies, if ready for combination or organization, as from decomposed bodies and elements, possibly with a stray ray from radium and the bile salts, helps with the moulding of cells in Nature. That must also play a considerable part in the Category laws of both Activity and

Defervescence. Under Defervescence, as above indicated, these similar exchanges account for most of the Lower Case pathological changes in cells, too.

During the habital focal stage, with the perpetual germ accretion, a recurrence of the positive Food Forms will doubtless prove to be the greatest essential of the Accumulative Law function. The continued *Parasitic Form* of the germ upon the bed of its nourishing host will also depend on those recurrent food forms and their need for that pabulum. *And successful and practical hybridizers should provide for this suitable and good food at each stage of growth; and thus alone will the purposes of any plant character desired be fully accommodated, according to this law of Constant Accretion.*

What the many other, and equally accompanying, practical Limitation and Restraint Factors may be can hardly be further discussed, nor discerned even as yet. Of course there are the observable lowly protistæ, with short variations, to study from, and their former local tension effects to feel one's way with. Also, in all subsequent growth there are the equally interesting waning, or *peripheral*, or less supplied causes to explain losses of Activity.

The principal factors to be borne in mind may be recapitulated. Each specialized Habital Focus, with its suitable nutritional attractions, controls germ development. That is the reason underlying egg or seed improvements by fanciers; just as much as neglect and hardihood in the world, or the field, or amongst all strivings and survivals, weed out or harden the courses of Nature.

Contrary to present views, the *external* signs of influence dominate most after-growth, and should be duly related to environmental observations. Both *internal* and *external* powers will have to be tested, as they influence Focal Growth. And only by this method, with an open mind, can the proper natural mouldings be adjusted. The Mendelian theory was not a law, but simply an observation, or a mathematical ratio of likely characteristics, of likely sports, or of likely reversions.

Under the systems of Bio-Mouldings raisers and hybridisers should try to improve the earlier hereditary stage, with its nutritional factors. And with the more favourable, nutritional, or habital and accretional conditions, they would learn the reason for, and profit by and supplement their present sole reliance on the Mendelian choice of characters. During the

first or the second stage provision for their environmental growing bias, they should recognize the need of attending to *both* stages, or to what has been discussed under the separate or bipartite influences.

Summary.

The task of inquiry has been set. Attention has been called to massive and lesser generalizations in the new science of Bio-Mouldings; and which might well be promoted and followed by all new laboratory workers[1] to inquire into any further *first* foundations for Life's Mouldings.

The First type of Nature's influences give rise to Germ Moulds; and the same factors have to recur under all conditions of growth. On an environmental and poor soil the Mould (Primary Mould) will develop the germ all right; but the subsequent moulding (Secondary Mouldings) may concert to show a starved or poor plant.

The Second Type of Nature's influences (*Environments*) *plus* Moulds give rise to Life Mouldings (*Models*) of living organisms; and the species only survive on a continued series of both those circumstances.

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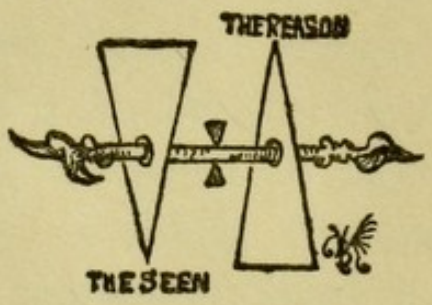
[1] The prejudice of old workers does not count, and, indeed, it should be shorter-lived (with their sinecure posts) than at present in vogue in our Colleges and Laboratories.

The Third Type of Nature's influences furnish only varying impressment mouldings, caused by the variety of surrounding elements. That stage may begin (but does not supersede the above germinal main influence) and it is restricted to the alteration or acceleration towards alternation, or vestigial cells, or organs, or new varieties.

Neither measuring (in the vulgar sense) nor mathematics—except for the trivial verifying equations—can be required to first trace and formulate the *Reason* of Nature's Mobile Laws.

THE
ELLIOT-BLAKE
OPTICAL CONES.



THE CENTRE APPEARS TO BE
ABOVE OR BELOW THE
MIDDLE LINES.

(*Vide Further Explanation in CONTENTS TABLE.*)

SUGGESTIVE PARAGRAPHS.

FINESSE.

HOMŒOPATHS.

SUGGESTIVE PARAGRAPHS.

FINESSE IN MEDICINE.

THIS word finesse deservedly reflects the newer and best part of what used to be considered a larger part of Medicine formerly than the more matter-of-fact craft of to-day. Finesse may be described as the cream of the art in the practice or variations of Medicine. It forms part of the culture of quick perception and generalization, which comes from the grouping of types, and then arranging them to modify the idiosyncrasy and variations so dominant in different cases, but never alluded to in the text-books. The grasp and then quick survey after these accumulations of whole series of facts demarks *finesse* and the refinement of those who stand out consequently as the more brilliant of the clinicians. Such supreme clinicians as Mayern, Mead, Radcliffe, Paris, Halford, Gull, and Jenner, were not at all picked men, *nor a*

bit great,[1] but they were examples of brilliant craftsmen, and there can be small doubt that they exercised their power unconsciously through the enticing and reassuring power of discriminating *finesse* on the right thing, at the right time, and with the right skill or diffidence to command confidence. So these varying niceties and complexions of diseases may be well worth cultivating by both young and older practitioners, especially when so little thought can be spared on them, with the growing absorption of ultra laboratory and stony piecemeal facts.

There is a good deal of the rampant licence in hypnotism, but which may very well be extended to a subject of inquiry by itself, under such masters as Braid, Charcot, or the Nancy School, and our English exponents. But the depth of concentration—the pith of hypnotism—does not always apply to non-nervous individuals. Yet it does have a restricted application sometimes with the congeneric parallel of finessing. A part of this influence in hypnotism may be included and ordinarily induced under finesse, they may often be allied; but under finesse it has the milder applica-

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[1] Title holders in ordinary = Conformity Lieutenants
Smaller hereditary Titles (taper into) = Conformity Tenants.

tion, although through this same influence! Hypnotism depends almost entirely (probably?) on suggestion, but suggestion only forms part of finesse, just as comportment may be reassuring, more or less. Both depend a good deal upon the personal and relative knowledge between doctor and patient; therefore cases have to be dealt with either quickly and strictly, or with some gloss and *finesse*. It satisfies the small details of the patient, and, above all, it recognizes and has to detect the universal idiosyncrasies, as apart from the text-book types. To the doctor, or consultant, who may be imbued only with hospital routine, his first lesson in finesse will be a pensive awakening to the more comfortable feeling of the seed and soil of his patient's troubles. It will raise him in his profession from the investure of fixity and lonely undressed facts, and the settled laboratory counterparts to weave around him the mesh of his own and his patient's beliefs in some remnants of imaged tenderness and sympathies.

In treatment, it means more individual carefulness; and, mostly, the ringing of the changes to fit variety. In mild cases, or in dangers, it equally spells success; and all through long cases variety of drugs, or even changes of doses, will often steer the course of the diseases away from the dangers that have to be con-

stantly guarded against. Indeed, in cases of Heart Diseases, Rheumatic Fever, Typhoid, and certainly Pneumonia, without a watchful care after the varieties of phenomena, and without the practice of an accompanying finesse in treatment, expectant success could not be so well assured. In Fevers young patients can better stand Cold Packs or baths; and older patients benefit most by hot applications and diaphoresis. The Text Book is not always the best guide; nor the "Compleat Angler." Eclampsia may be due to an absorbed poison, or exhaustion, or both; yet opium, itself a poison, may hasten elimination, as well as soothe; and this I practised and found out in 1890. Heat as well as cold may be substituted with success in the pains of pneumonia. Arsenic often improves despondent or melancholic patients. So finesse comports the treatment to the comfort of the patient, just as much as to counteract the symptoms. Even out of the way jaborandi or pilocarpine can sometimes be found to relieve the tension of acute rheumatism or gout. In the way of uncommon corrective tonics, Tincture of Arnica internally, and Ammonium Chloride seem to have a host of uses in nervous or "liver" cases. The feature of finesse should be to recognize, and not to blame, when it can legitimately stray from

the orthodox, because it so often depends upon out of the way or uncommon practice, coupled with a readiness to improve the applicability of any treatment, however odd, to the suitable symptoms of the patient.

A NEW PHARMACOLOGICAL DOCTRINE versus HOMŒOPATHY.

Therein there may be a word said for Homœopathy. But it does not rest on what Hahnemann said. Hahnemann's *similia similibus curantur* solely referred to symptoms; *he knew no Pathology*, and recognized none.

And such an application was, with the utmost genius of the orthodox doctors of his age, repudiated. But this subject may be referred to on another occasion, so it will not be fully discussed now.

Suffice it, here, to state, that viewed, not from Hahnemann's point of view, but in the light of present-day pathology, and with finesse and a refined view, it does cover a startling glimmer, which Hahnemann may not have dreamt of as "a truth." Groping falsely as he did, he was *not* all quack! His divisioning of "powers" was wrong. But the minute infinity of Drug reaction and drug antibodies, although not

known to him, may, now and here, be described and insisted upon. That new doctrine does, and shall, open up another real vista of a new light for the next generation of pharmacologists. I have held to this interpretation for twenty years, and see no reason to alter it.

The antibody of every drug, and every bit of good, must increase also a General Seral Antibody (not yet discovered, but almost certainly existing, *i.e.* as an alternating part of the specific Antibodies). It would be a useful counteractant in favour of every-day body elimination and protection—besides supplying the Drug-Antibody itself, and upon which I here insist.

The polypharmacists have all gone out of fashion. But even there—with their obviously large finesse—we should not sneer (in face of this new truth) when, probably, the enlarging of the antibodies increased the effect of the above Stimulated or General Seral Antibody.

ORGAN FATIGUE.

The New Pathology which I have outlined before, and since, 1905, and in part in this volume, must be treated of in a separate volume. It has appealed to me since my college days as better than the present vogue of pathological disease resistance, or the fighting phalanx which the body presents, and so often described by pathological writers. The foundation rests upon what I call an innate power of the body to multiply or govern regeneration in the tissues. Its relation to pathology is a long story. The whole gist, however, of the undoubtedly preceding physiological state, and the pathology which of course must arise out of that biological sequence was fully laid, so far as I know for the first time, before the profession in my

communication to the *British Medical Journal*, at Christmas time, 1905. I said there, that pathology consisted of a Mimicry of Biological Tissue. That founds the basis of my fifteen years' work on Pathology.[1] But the vast accumulated details have been collected by me and connect and interconnect that valuable system. It has since been supported by others; but the fuller interpretation may not be pursued further, at present. However, a connected example may be followed, and the bearing of finesse also pointed to.

FOR the sake of treatment, can a person suffer from Organ Fatigue? If so, it would present a fine stage for finesse to enter its full play. By Organ Fatigue is meant, the first stage of disease as an entity. According as one realizes this meaning of the above relation to the physiological or biological derangement, so this first stage, which has to be graphically called *Organ Fatigue*, must occur and recur before the onset of Diseases proper. Now, the first stage would be the exhaustion of parts of the

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[1] Pathology—*sui generis*, not Physiology. Organ Pathology relates only to General Pathology. My Pathology should be regarded as not physiological as misrepresented but POST-FUNCTIONAL.

organ—a *Drain Stage.* The second stage drops imperceptibly into the effect of the above upon the economy or system of animals—a *Debility Stage.* The significance of this last stage reveals itself distinctly with the Functional Stage, formerly known only by its unaccounted-for functional symptoms.

The first of the former stages represents the Recuperative Stage. But the Functional Stage does not recuperate so well, and wants the application of drugs, or the methods of finesse or insight, to help in alleviation. Finesse accepts the functional state as quite real, and *not* sham.

Probably a good deal of our debility, and most chronic debility, starts that way, as Organ Fatigue.

Organ Fatigue only gradually ends in Organic Disease.

The finesse of sharp sight, then, helps one to distinguish this genuineness, and accounts for the cause of the pain and anxiety of patients in the so-called functional and hysterical class of cases. They must henceforth be mapped and fixed as belonging to periods just antecedent to the declaration of known pathological diseases. Those cases in the future will be known as due to Organ Fatigue.

CURATIVE PARAGRAPHS.

REST DIET.

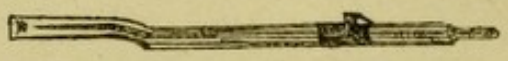
CURATIVE PARAGRAPHS.

DISCURSIONS.

SOME people do not believe in Medicine. The above New Pharmacological Doctrine will put it in an entirely new light.

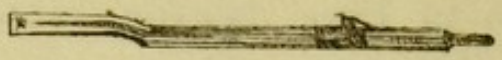
Non-appreciation may be due to want of grasp; and even though a literary bent favours wisdom, raillery may rancour, and peculiarly, and often, to be noticed with despondent phthisical patients. But the poison of phthisis, like some other poisons, as with fevers, opium, alcohol, and rarely gout, but most in phthisis, stimulates all patients, and a genius towards genius; it is another proof for my view of its additive nature, and not the popularly and the wrongly regarded instability. It may largely account for the wonderful traits of Pope, Sterne, Hood, and Stevenson, Gould and Beardsley of later years.

BEARDSLEY'S shaft against doctors was "A merry Andrew in a town is more beneficial to the health of the inhabitants than twenty asses loaded with medicine." But a merry clown does not visit a sick patient, as the doctor does; and many a doctor can be jovial besides.

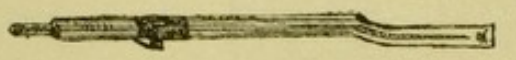


ACCORDING to the New Pharmacological Doctrine the poisons of certain diseases, such as Typhoid, Tetanus and Diphtheria, kill and cure at the same time, the one or the other reaction predominating.

WHILST other results of infection, as in Syphilis and Cancer and Phthisis, are too well borne by the body to kill and cure, and therefore they only kill or perish, the termination being insidious, and depending upon the introduction at once of sufficient infection. Both these paragraphs are full of great truths.



THE oath of the Royal College of Physicians enjoins that "you shall not employ secret remedies." But all new introductions have to be practised in secret, before arriving at their confirmed application.



OATHS are too narrow for the expanding obligations of the Profession. In the learned professions a sense of educated justice governs the honourable.

FURRED TONGUE.

FOR a *Furred Tongue*, after the usual half-dozen remedies have been applied, a mouth wash of Chlorate of Potash and Potassium Iodide (āā 15 or more gr. per ʒi) will clear. Although this seemed new to me, since finding it out I came across the old process of calcining a "vegetable" as the ancients called *porifera espongia officinalis* and which they used (with the iodine in it!) as a clearing wash for

throat troubles and croups. So, partly, it may be a re-discovered novelty, though it may be claimed as more convenient, for this rather favourite application of mine.

KNEE-JOINT WEAKNESS.

IN KNEE-JOINT WEAKNESS, sometimes called *Slipped Cartilage*, also in the similar ANKLE and WRIST WEAKNESS, the first signs towards loosening of the cartilages and lax ligaments will be due to Organ Fatigue. And, short of an Elastic Knee support, or Side Irons, marked attention of the Will Power to each movement will do away with the loss of muscular tone which began it; and it will cure primary cases.

THE REST CURE IN DIET.

Pavlov has shown that every main diet—*and may one not extend this to every variation of the main diets?* —can show accurate responsive selections to the necessarily corresponding secretions of digestive enzymes or proteolytic appropriations. We, in England, pretend to have added learnedly to his views, but we (as usual since the examination age and thraldom) have only borrowed from his beautiful originality.

It seems to me that is but a threshold. It really applies to all manner of diseases with their nerve factor, especially to what may be termed the nerve digestive derangement in disease, and what elsewhere I have termed the *excess nerve factor.* If that be granted, as it ought to be, then the Rest Cure extends to all the diets involved.[1] Rest will give a great temporary relief for recuperation, and a repose to the functional nerve forces (used in the sense above indicated).

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[1] The waste of time spent over perusing historical medicine may be exemplified by an old custom. The old Roman and ancient practice of applying a vomitary after their excessive Feasts, was in no sense a *rest cure*, but an unreasoned and a coarse escape from their gluttony.

I regard biliousness or migraine as not only due to proteid excess, and an excess poisoning, but the equal poisoning, or the weakened function, attributable equally to hydrocarbon or carbohydrate digestions, and they will be relieved by the corresponding Rest Cure or abstention. So the Rest Cure application resolves itself into a remarkable simplicity.

Sick headaches would, by the majority, be thought to be cloyed and aggravated by milk (Water 858, Casein 68, Fat 38, or more per 1000). But in protein-sick cases protein rest should be aimed at, and the casein is more easily digestible than most, therefore the fat acts beneficially and cures, as advised by me. And the milk should be taken hot, and only milk consumed during the day.

In asthma, whatever the offending category of diet, as in those sensitive to milk, or other diet, the general nerve irritation will be greatly relieved by abstention from that important diet, and so aid the other remedies.

In hypochlorhydria the brash and excess of acid connects it, not with the at present supposed morbid dyscrasia, but with the disordered proteid function. So by cutting out this faulty proteid diet, and giving cream, and well-oiled salads, or butter, it helps to

quiet the overwrought proteid function, and gives the Rest Cure—which is much the better explanation.

In Rheumatism the diet at fault has to be curtailed, until better digestion supervenes, when the amino acids and protein group of accumulations can be physiologically absorbed and duly eliminated, or a nitrogen equilibrium diet re-established.

DIABETES.

With regard to the similar abstention of Sugar in Diabetes, *may not diabetes rest for its cause on the nervous disorder and interference of the Sugar or carbohydrate digesting function!* Certainly Pancreatic diabetes does to a large extent. Therefore, under my suggestion, the abstention from these diets gives the Rest Cure to the assimilating function of the sugars.

I have thought of tracing Diabetes to a gastric and intestinal lesion. In 1903, at the Madrid Medical Congress, on discussing this functional nerve influence with Dr. Pavy, he still held to his doctrine of the larger sugar molecule being allowed through the Kidneys. But, although the kidneys may show signs of irritation, I have certainly also seen the congested or inflamed state of the pylorus and duodenum

onwards, and which of course has a primary, and not as in the case of the kidney only, as I hold, a secondary influence. The Pylorus and upper intestines, as the suggested deranged area, would command and affect the nerve ending starting points for efficiently functioning the invert, diastatic, or saccharifying enzymes in their stimulating course. Though, of course, Conheim's and Pavy's press juice experiments prove some inter-cellular enzyme actions, they need not entirely, for they may still be partly under nervous control.

Any suitable Diet Rests, as abstention, in old age relieves the wear and tear of the alimentary and other organs, and carries the elderly patients imperceptibly into healthy and desirable phases of life, and to that ease associated with enjoyment and a hopefulness in a future.

Finally, the Rest Cure in Diet is a *long service treatment*, or a kind of hygienic prescription. It does not interfere with the ordinary symptom and drug assuagements, and which may be compared to a *short service treatment*.

MEDICAL SHORT WAYS. QUARANTINE.

LONDON CATARRH.

Short Ways for Common Ailments.

THE BURNING GLASS.

The burning glass can be used as a convenient way to replace more expensive apparatus for the removal or burning at the small focal pencils of sunlight such small tumours as Bland Sutton's tiniest mole fields, small nævi, moles, telangiectasia, dermal polypi, superficial stains, and the base of warts or small corns; but the two latter can be better removed by the ordinary methods. The patient troubles about these small minor surgical tumours, and at his leisure can persevere and succeed in their removal by pencilling the rays from the burning glass upon them. It should be a biconvex glass giving about a $2\frac{1}{2}$ to $2\frac{3}{4}$ in. focus, and used with a medium sun shining an hour or so before midday or after. The actinic and chemical rays may be focused for three to six seconds

till whitening occurs, just as with the fine Paquelin or electrolysis, and a sufficient number of spots made to nearly cover the area. Try to finish each patch at a sitting. It scales off in seven to ten days. Analgesia by cocaine seems rarely required, though, no doubt, the pin pricking feels like an insect's sting.

Since using these Burning Glasses, I have thought out a plan of improving my older method of using iodide and iodine applications with exposure to the sun for lupus, by colouring the glasses, or having a chamber with the ammoniacal sulphate of copper solution, and pencilling the actinic rays direct upon the lupus, after Finsen's well-known method.

THE NASAL COLOUR SHIELD.

Three triangular pieces of coloured cloths in Red, Purple and Orange, truncated at the top, are sown together to fit over the nose; there may be a slip of foil between the inner folds, and the whole of the layers stitched round so as to form a nose shield. This shield against the light can be retained over the nose with spectacles or clips; and by cutting off

the colouring rays of the sun, and worn constantly, or whenever possible, it gradually bleaches the over-coloured nose, or modifies the cosmetic effect in contrast with the other parts of the face. Useful in Red Nose, Blossom Nose, Indigestion Nose, Smoker's or Nicotine Nose, Acne Rosacea, and some eczemas, or as an addition to other treatment.

Whether Unna's direct colouring, or the chromatophore wandering cells, or the analogy of the plastid activity holds good, or the action of all, or congestion, play their several parts in the colouring of the living dermis, the sun's rays must activate them. And by the use of this shield that action can be modified.

A SHORT WAY WITH FURUNCULOSIS.

Another puzzling and awkward complaint to treat is the ordinary onset of threatening boils. The usual text-book directions are too elaborate, and generally fail. I used to prescribe a lotion, with the usual treatment of a caustic point, or a match point and pure carbolic acid.

But to abort them, my view was to increase the flow of serum circulation, and, then, to add just that new point, that extra help, *an antiseptic bacteriacide*, which would tell in favour of the patient and dispel the *Micrococcus pyogenes, albus* or *aureus*, or other local dermal infection. That can be done by washing the part with hot water and antiseptic soap, and then applying a little diluted antiseptic such as a formicaldehyde diluted solution, and well rubbing in a little of the double cyanide of Zinc and Mercury.

Since adopting this plan, Wright's too elaborate vaccine, and the formidable Bier's congestive machinery have become fashionable. Neither of them gave original views, they were well known to pathologists. But the principle of the above simpler plan was a more practical way, and founded and anticipated on *the same lines*, and it is still most efficacious.

QUARANTINE FOR PHTHISIS.

LONDON CATARRH.

Just previous to Koch's introduction of tuberculin, my own impression led me to be a votary of quarantine for phthisis. And when returning to England in 1890, after attending the Berlin Kliniks and Koch's laboratory, at the time of his introduction of the tuberculin treatment for lupus and tuberculin injection for tuberculosis of the lungs and the bones, I happened to travel with a gentleman using his Detweiller's flask. So I discussed consumption with him, and asked whether he would submit to be quarantined till he improved or died? For it will be remembered, just before then, Mr. Long and Sir V. Horsley had supported the Strict Muzzling Order of the Board of Agriculture, for the isolation of dogs, and so as to stamp out hydrophobia. He readily fell in with my then new idea, on one condition, that he should be kept by the State. I agreed in thinking the disease, Phthisis, was a State question. Quaran-

tine for consumptives was a novel notion then. But, now *it seems* to be everybody's panacea. However, it is not done : *and it ought to be done.* It would be better than the almost useless Sanatoria, and the only partly applicable Koch's tuberculin treatment. I always held that the tuberculin we saw in 1890 cured some early cases ; the reason was unknown. But I believe *it increases the poison at the tubercular focus* (vide *supra*, Curative Par. : *New Pharmacological Doctrine*) and so increases the body reaction against the too benign Tubercle Bacillus.

But this quarantine system should be extended till every house has its Quarantine or Isolated Room. Into this latter room could go all infections not applicable for the Isolation Hospitals.

This system, too, would equally improve the hold on Ringworm, Bronchitis, Erysipelas, and Catarrhs, &c.

LONDON CORYZA OR LONDON CATARRH.

London Catarrh, no doubt, is English Catarrh, but London worry and pace make it the chief endemic centre. English Catarrh, unlike the American variety, does not prepare for pneumonia, but only occasionally leads after certain attacks to bronchitis, a very important distinction.

The second point to bear in mind about London Coryza, besides the local infection and London association, is that the cause is not specific but various. The incidence of London Catarrh, most probably, has a double infection or plural infection. Besides the debility, or the irritant gaseous nature of the atmosphere, or physical weakness—and more rarely a hay fever susceptibility—and added to one of these conditions there apparently supervenes, not one, but a double or plural infection from the ordinary flora on the mucous membrane of the nose. More than that, the number of organisms found do not occur in

constant sequence, they may be the ordinary cocci and bacilli, or the stronger *Micrococcus catarrhalis*, or the tetragenus or staphylococcus, diplococci, fungi, or pneumococci. But it appears to me likely, *and I wish to lay stress on this*, that their heightened passage through the man, under the above favourable conditions, increases their virulence, whether a single or a double infection, together with the patient's flora or organisms. And spreading occurs from that infection with an increased virulent (human) stock, and gives the double incidence, and the well-known attack of London Catarrh.

Treatment.—If an habitual London sufferer removes to the country he will be away from this double infection, and will thus immediately become most likely immune.

All London Catarrhs should be quarantined for two weeks, to get over the *three phase* period—three days coming on, three days attack, three days getting well. Pathologically that is due not to the life of the organisms, *but to the recuperative power of all mucous membranes.*

Double Cures should be applied ; such as removal from irritant fogs, dust and human fomites, with antiseptic irrigation of the nose, but with *double antiseptics*,

never single antiseptics. Turkish Bath, with warm clothing, and free air flushing in the open country. "Starving a cold in the head" should be altered to *feeding a cold;* and exercise in pure air if isolated. As to drugs; possibly opium should be combined with mercury; or any tonic, as of Fellow's syrup, taken. Avoiding those with catarrh in public carriages and places is the chief prophylactic. The law ought to be, to quarantine them.

AN EASY TEST FOR MARGARINE.

A rapid margarine test may sometimes be a desideratum instead of the elaborate specific gravity test, or the Valenta test. Any ordinary solution of Sulphurous Acid can be obtained from the chemist, and a little can be run against a smear of margarine on a plate; after a time it gives a pink colour in the case of margarine, and none with butter. *The confirmatory test* proceeds with a similar smear of margarine and one of butter, and a little sulphurous acid solution run near both; then rub with the flat tip of an old flexible, bright steel knife, *each for an equal time:* if it soon goes black then it is butter, if it only turns grey then it is margarine.

THE UNIFIC PLAN.

AN UNCIAL PATH.

A Simplification.

A SPECIFIC concentration of well thought out experience and data, modelled into only one test or case may well arrest the attention and represent a commendable habit, and stand for a type to be aimed at under what may be called a unified system, or The Unific Plan. A bold stop to too lengthy research essays or discourses would simplify a great deal of unnecessary work universally encountered. This Unific Plan purposely opposes the figurative, descriptive, and statistical enlargement of subjects buttressing the roundabout, rotary, or gyratory system.

In this age of raging and eugenic statistics perhaps it seems hardly feasible to expect many adherents of the opposite unific method of quietude,

or reliance on one good case as it comes along, or of always being on the look out for it. But for those who write to be read, it will at least put them on their guard. For who has not known books and articles produced everywhere weighted with overpowering eloquence or the blinding pepper of erudite quotations and laboratory plottings, etc., ending in the usual negative or nonconclusions, or with diminutive or wrong conclusions. Again, foundations on large numbers have a tendency to presume or forgo the personal element, however elementary and satisfying a thousand subsequent cases of corroboration may be. The stray good case and unific concentration fix the person and the one certainty. Addison's study of a few diseased suprarenal capsules reflected his own satisfaction, and fixed the form of Addison's disease for ever. That is better than a thousand cases of Dyspepsia rot published as a book on Dyspepsia.

All the discoveries belong to this Unific system: with Pasteur's first case of Pébrine, it led to all the rest. Koch saw more for the world at his first sight of his tubercular rods, than did all the shuffling detail and stock statistics of the English adulation of officials, stuck like old stock-takers, upon a Commission on Tuberculosis. My first des-

cription of a diphtheria case treated by Antitoxin seemed to me a certainty; it proved its efficacy; and it was one of the earliest on record in England. Likewise my own inoculation with Haffkine's cholera vaccination was probably the first of its kind in England, and it heralded the practicability of vaccine therapy.

No elaborate dissertations or statistics would accomplish correct determinations. Elaborate examinations may repeat much, but they instil and accomplish nothing, except the multiplication of classifications. The pre-eminent clinician Trousseau said, the nearer we get to the simple fact the nearer we get to the truth.

Look at the simplicity of greatness. I do not refer to the simplicity of nothingness; but to that patient, settled, determined conviction of wisdom felt to be feasible and real, and its single, central, annealed preciseness. Take one extract, like *De motu cordis*. Here *one* object, *one* case, presented and determined itself; and all Harvey's soul was worked and wrapped up in it. Again, one living change, one living ferment clung to the conviction and clarity of Pasteur's work: especially when opposed to Liebig's chemical basis of life and fermentation; but, as I have

shown under Bio-Mouldings, the swing of the pendulum of favour may again have to take into account the chemical basis of the living changes. In Science this unification holds value, and puts it above all literature. Literature can hardly be brought into this system for stemming elaborate bounds. Literature, because of the love of diffusiveness, or lack of straight sense, or of familiarity, or of orthodoxy, and of discursiveness, courtesies to statistical compilation, and diffuse recitations, and perhaps more readily appeals to average persons. Whilst the narrow Unific Plan wants more concentration, gives more result, encounters jealousy, and perhaps requires more devoted guarding and emphasis. But it will be the value of any Unific plan which will influence and obtain the broader World's verdict. Parade all the discoveries! And how few relied on the amplitude of review, and did not draw upon *the exception*, and *not the rule*, of the prevalent statistical criterion.

Let us examine the matter in hand. Jenner staked all on his first case, and on his own child. But he had an early idea—and which proved his originality — for eradicating Small Pox, at about twenty years of age. Still, it was that first unific concentration of his work, on that one case, which

was the determining factor in his own belief and in its efficacy. All others, the millions of statistics that have since arisen, in no way eclipse his single observation. Our devotional enthusiasm is due to the man who faced and described that essential case. Somebody describes a thousand cases of Koch's operation as the best for drainage in prostatic diseases. But under the uncial method, Feyrer's first case of enucleation satisfies his own self, and it steps into the front rank as Unific Concentration, and upsets an enormous number of the old statistical retentions and examination repose : his corroborating cases in numbers may fill a book, but they do not change the first fact. Numbers used to extol successful tracheotomies in diphtheria, but Behring and Kitasato's antitoxin, when definitely tested, was an elective proof of its singular directness. Wren's produce, like that of all great men, reflects the unific plan. Wren's works were all single pieces. He demonstrated anatomy at 22 years of age ; but at that time, he also cast the shadow of an original mind by making several inventions, and it was that new bent, and not *copy bent*, that led to, and gradually formulated his architectural masterpieces.

The statistical treatment ought to be used as a secondary plan, or addition, rarely even for corroboration, and, at last, only as complementary detail. Altogether the Unific treatment claims to be the most direct method of examining and fixing a subject; and the most useful and best primary test. The Rev. Dr. William Wotton, like Magliabecchi, knew Greek and Latin at 5 years, Hebrew, Chaldaic, Syriac, and Arabic at 10, Welsh and other dialects later. His precocity was summational, but he left no single thought worth having, except in Religion, for others. The learned accumulators and statisticians do ditto. They know and record details in precocious profusion; but posterity gets nothing.

Finis.

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