

**A view of ehe [sic] science of life : on the principles established in The elements of medicine, of the late celebrated John Brown, M.D. ; with an attempt to correct some important errors of that work ; and cases in illustration, chiefly selected from the records of their practice, at the General Hospital, at Calcutta / by William Yates & Charles Maclean ; to which is subjoined, A treatise on the action of mercury upon living bodies ... ; and A dissertation on the source of epidemic and pestilential diseases ... ; by Charles Maclean, of Calcutta.**

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A  
V I E W  
OF THE  
SCIENCE OF LIFE;  
ON THE PRINCIPLES ESTABLISHED  
IN THE  
ELEMENTS OF MEDICINE,

OF THE LATE CELEBRATED  
JOHN BROWN, M. D.

WITH AN ATTEMPT TO CORRECT SOME IMPORTANT ERRORS  
OF THAT WORK ;

AND

CASES IN ILLUSTRATION, CHIEFLY SELECTED FROM THE RECORDS OF  
THEIR PRACTICE, AT THE GENERAL HOSPITAL, AT CALCUTTA.

BY

WILLIAM YATES & CHARLES MACLEAN.

---

“ THERE are some modern Practitioners, who declaim against  
“ medical Theory, in general, not considering, that to think  
“ is to theorise ; and that no one can direct a Method of  
“ Cure to a Person labouring under Disease, without think-  
“ ing,—that is without theorising ; and happy, therefore,  
“ is the Patient, whose Physician possesses the best Theory.”

DARWIN'S ZOONOMIA.—PREFACE, P. 2.

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Philadelphia :

1797.



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TO WHICH IS SUBJOINED,

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On the Action of Mercury upon Living Bodies, and its Ap-  
plication for the Cure of Diseases of Indirect Debility.

AND

A D I S S E R T A T I O N

ON THE SOURCE OF

*EPIDEMIC AND PESTILENTIAL*  
D I S E A S E S ;

IN WHICH IS ATTEMPTED TO PROVE, BY A NUMEROUS  
INDUCTION OF FACTS, THAT THEY NEVER ARISE FROM  
CONTAGION, BUT ARE ALWAYS PRODUCED BY CERTAIN  
STATES, OR CERTAIN VICISSITUDES OF THE ATMOSPHERE.

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By *CHARLES MACLEAN*, OF CALCUTTA.

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WHITEHALL :

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*Philadelphia.*

1797.



THE  
SCIENCE OF LIFE

OR THE PHYSIOLOGY OF THE HUMAN BODY

BY JOHN BROWN, M.D.

OF THE LATE UNIVERSITY OF CAMBRIDGE

WITH AN APPENDIX TO THE SECOND EDITION

BY THE AUTHOR

AND A NEW EDITION OF THE FIRST PART

BY WILLIAM BROWN, M.D.

OF THE LATE UNIVERSITY OF CAMBRIDGE

A NEW EDITION

OF THE SECOND PART

A DESCRIPTION

OF THE HUMAN BODY

AND ITS FUNCTIONS

IN THE STATE OF HEALTH

AND OF THE EFFECTS OF DISEASE

ON THE HUMAN BODY

AND ITS FUNCTIONS

IN THE STATE OF HEALTH

AND OF THE EFFECTS OF DISEASE



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# PREFACE.

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HAVING applied to practice, in the General Hospital, at Calcutta, those medical Principles, vulgarly known by the Name of the Brunonian Doctrine; and being convinced, from the Result, of their Conformity to truth; we think it may be useful to attempt to promulgate the Doctrine in India, where it seems to be almost wholly unknown, and to call forth the Attention of medical Men, to a Subject so worthy of Investigation.

SOME Cases are annexed, in illustration of the Mode, in which, according to our Ideas, the Principles of the Doctrine should be applied to practice.

To those who cannot be acquainted with the Circumstances, it may be proper to explain, why two Names appear to this Publication. Having carried on our Practice together, in the General

PREFACE.

Hospital, at Calcutta, and having by Chance discovered, that each of us entertained a Design of Attempting to promulgate the Doctrine of Brown, with some modifications, in India; we thought it might be more conducive to the End in View, to consider the Subject conjointly.—The Result is now submitted to the Public.

WILLIAM YATES.

CHARLES MACLEAN.



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## ADVERTISEMENT.

**H**E who abandons Principles in Deference to popular clamour, and he who perseveres in Error in spite of Conviction, may indeed obtain a momentary Celebrity; but they are equally unqualified for the Promotion of Science.

*As Truth, not an indiscriminate Assertion of any Doctrine, is the Object of this Publication, Members of the Profession, and others who may be so inclined, are invited to communicate Facts, or Observations, whether they may tend to confirm, or refute the Principles which it avows.*

*The Communications thus received, will be published, with Comments, with or without the Name of the Author, as may be most agreeable to himself.*

*Papers on this subject, addressed to Mr. MACLEAN, to Messrs THOMSON & FERRIS, Printers, Calcutta, or the Publisher, Philadelphia, will be attended to.*



# THE HISTORY OF THE

The first part of the history of the  
country, from the first settlement  
to the present time, is divided into  
three periods, the first of which  
is the period of discovery and  
settlement, the second of which  
is the period of the struggle for  
independence, and the third of  
which is the period of the  
establishment of the present  
government.

The second part of the history of the  
country, from the first settlement  
to the present time, is divided into  
three periods, the first of which  
is the period of discovery and  
settlement, the second of which  
is the period of the struggle for  
independence, and the third of  
which is the period of the  
establishment of the present  
government.

The third part of the history of the  
country, from the first settlement  
to the present time, is divided into  
three periods, the first of which  
is the period of discovery and  
settlement, the second of which  
is the period of the struggle for  
independence, and the third of  
which is the period of the  
establishment of the present  
government.

The fourth part of the history of the  
country, from the first settlement  
to the present time, is divided into  
three periods, the first of which  
is the period of discovery and  
settlement, the second of which  
is the period of the struggle for  
independence, and the third of  
which is the period of the  
establishment of the present  
government.

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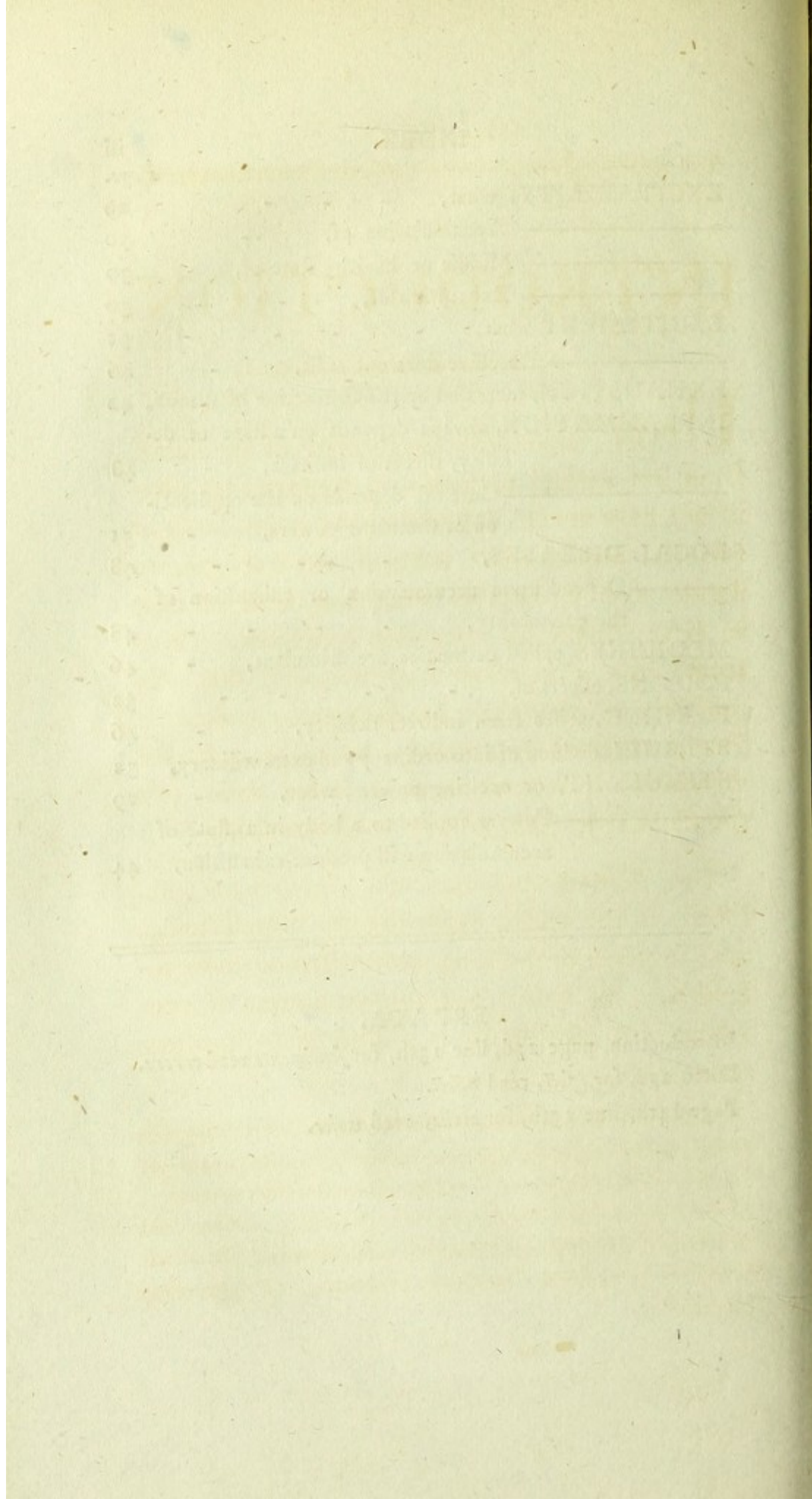
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## ERRATA.

Introduction, page 23d, line 13th, for *sentiments* read *errors*.

Ditto 22d, for *effect*, read *affect*.

Page 24th, line 15th, for *molis*, read *moles*.





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# INTRODUCTION.

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UPON examining the records of medicine, from the earliest periods, it appears that physicians have never considered the living body as subject, like all other parts of the universe, to regular and immutable laws; but seem actually to have drawn an opposite conclusion. It is from this circumstance principally, that the practice of medicine has hitherto acquired so small a portion of certainty, as still to merit the appellation bestowed upon it, more than two thousand years ago, of a "conjectural art."

THE various doctrines which have been published to the world, regarding the human body, are in general, nothing more than a mere assemblage of words, without the power of conveying any distinct ideas. \*Hypothesis has suc-

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\* As truth is but one, and the hypothesis, which may be formed upon any given subject, infinite; so the chance of any hypothesis being true, is as one is to an infinite number; or the certainty of its being erroneous, absolute. Every just deduction of reasoning, is properly called theory. But these terms are, to the great detriment of science, very generally confounded.



ceeded hypothesis, in the same regular manner, that physician has succeeded physician. Opinions have been adopted, according to the chances of education; supported by the authority of great names; and religiously adhered to, as fundamental axioms, into the truth of which it would have been heresy to enquire.

THE mischiefs arising from this source, “greatly extend their influence, and spread in every possible direction, when error acquires the patronage of authority, and the protection of dignified names. It then takes its chair in the schools, and assumes the pompous titles of profound, refined, or liberal knowledge. Raised to this eminence, the industry of a single teacher, or author, may corrupt thousands; that of a few, whole nations; and the addition of a proportional number, ruin the education of a world.

“THIS universal diffusion of error, receives sanction and establishment from the progress of time. It becomes venerable: and every attempt to detect it, is branded with the name of profanity or madness.”\* Such has, unhappily, been too long the state of science.

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\* Vide Introduction to the Outlines, &c. by John Brown, p. ii.



But, of late years, every department of human knowledge has undergone a rapid improvement. The dawn of reason has, in a particular degree, begun to enlighten the medical world ; and the practice to assume a consistency, which could only be founded on the discovery of the laws, by which all living bodies are governed.

THIS discovery, one of the grandest efforts of the human mind, that ever dignified the page of science, the discoveries of the immortal Newton himself not excepted, is contained in the Elements of Medicine, of the late celebrated John Brown. This discovery, hitherto neglected from ignorance, opposed from the shame of recantation, and calumniated from interest, prejudice, and passion, contains so many undeniable truths that, to an unbiassed mind, it only requires to be known, in order to be admired and adopted. The doctrine, although it has not yet been sanctioned by the medical schools of Britain, has, however, been very generally received, in the other schools of Europe, and in America. “ In the University of Pavia,” says Dr. Rasori, “ undoubtedly one of the first in “ Europe; there is hardly a student endowed “ with talents, who is not a Brunonian. The “ doctrine begins equally to spread in Ger- “ many. Many of the periodical publications “ of that country have noticed it, and the Ele-



“menta have lately been published there. A  
 “friend at Genoa assures me, that several sur-  
 “geons to French men of war have informed  
 “him, that Brown is known and much admired  
 “in France. In the University of Pavia,  
 “Brown is in high esteem, even with some of  
 “the most respectable professors ; and in other  
 “parts of Italy, I can assert, from my own  
 “knowledge, that old physicians have not refus-  
 “ed their sanction to many of the Brunonian  
 “principles.”\*

ONE of his Italian critics, supposed to be  
 Professor Carminati, says, “*Quaerenti mihi*  
 “*causas incredibilis prope illius commotionis ani-*  
 “*morum, atque ingentis feré plausus, quibus*  
 “*nuperimè singularis illa hypothesis, cui novum*  
 “*Universæ Medicinæ Systema celebrismus An-*  
 “*gliæ Scriptor et Medicus BRUNO superstruxit,*  
 “*ab iis optimæ spei adolescentibus excepta esset,*  
 “*qui in florentissimo Ticinensi Archigymnasio sa-*  
 “*lutaris artis studiis omnibus mecum incumbunt,*  
 “*peradium sane, non fuit eas \*\*\*\* invenire.*”

MANY translations and editions of this work,  
 and various criticisms upon it, have appeared  
 in different parts of Europe, which it is by  
 no means necessary to enumerate here. That

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\* Vide Beddoes' Life of Brown.



the knowledge of it has also made a considerable progress, among the medical philosophers of America, is evident, from the frequent allusions made to it, in a late publication, by Dr. Rush, of Philadelphia. “ The principle of the gradual application of stimuli to the body, in all the diseases of indirect debility on the one hand, and of direct on the other, opens a wide field for the improvement of medicine. Perhaps all the discoveries of future ages, will consist more in a new application of established principle, and in new modes of exhibiting old medicine, than in the discoveries of new theories, or of new articles of the *Materia Medica*.”\*

ANOTHER proof of the excellence of the doctrine, no less convincing, is deducible from the frequent plagiarisms of its fundamental principles, by which some men, desirous of passing them upon the world as their own discoveries, have lately endeavoured to establish a reputation for superior genius. Any attempt to detect these, in their various and most infinite ramifications, would, as Dr. Beddoes † very justly re-

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\* Vide “ *An Account of the bilious remitting yellow Fever*,”—page 284.

† It would be injustice, upon this occasion, to pass over, without a tribute of applause, the laudable exertions of Dr.



marks, be now unnecessary. Among the most conspicuous, however, in this list, we may particularise Doctor Gritanner.—There is not a single idea in any of the papers, which he has published upon that subject, that is not borrowed from the Doctrine of Brown, or the different modifications of it, discussed in the Medical Society of Edinburgh, and recorded upon its books. These he has freely used, without the smallest acknowledgment. His doctrine, of the principle of irritability, is taken from a paper, written by a respectable member of that Society.

DR. G. was a student at Edinburgh, long after the publication of the *Elementa Medicinæ*; and at a time, when the principles of the doctrine, were the subject of investigation, in the literary societies of that University. His plagiarisms must therefore have been wilful; and no acknowledgment, subsequent to detection, can

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Beddoes, in promulgating the knowledge of Brown's doctrine, He is perhaps the only author in Britain, who has dared publicly to assert the merits of it. This ingenious conduct, and the liberal manner in which he stepped forward, to benefit the unfortunate family of our illustrious philosopher,\* equally evince his superior mind, and universal philanthropy.

\* Vide a new edition of the Elements of Medicine, of John Brown, M. D. with a biographical Preface by Thomas Beddoes, M. D.



be considered as an atonement. There is something so flagitious in the attempt to rob departed genius of its honours—honours too, in the acquisition of which friendships, emolument, and ease, were all sacrificed,—that it cannot be too severely reprobated.

It is a common and often a true observation, that “no man is a prophet in his own country.” Accordingly, it appears, that this doctrine was longer neglected, and is still more anxiously opposed in Britain, than in other nations. Few men at an advanced period of life, have sufficient courage to relinquish sentiments to which they have been habituated, from their early years; fewer still have candour enough to acknowledge the truth of what they have strenuously opposed; and young men, although generally open to conviction, seldom have sufficient confidence in themselves, to stem the torrent of general opinion. The rising generation, however, in order to adopt the new doctrine, will not have many sacrifices to make. It will neither effect their interest, nor wound their vanity.

THAT the force of truth already begins to silence the unmeaning clamour, which has hitherto been made against this doctrine in Britain, is evinced, by the reception of a late voluminous publication, of which the chief merit con-



sists in, an occasional and imperfect coincidence with the principles of Brown. It will readily be perceived, that we allude to the *Zoonomia* of Dr. Darwin,—a work which, from the excellent character and reputed talents of its author, had raised considerable expectation in the public mind. But disappointment, on the perusal, was in proportion to the previous expectation. Instead of important and luminous corrections of the doctrine, which might have been looked for, at this time of day, from a man of abilities, pursuing the same tract of investigation, a want of argument and correct reasoning, is found to pervade the whole. It is such a *rudis indigestaque molis* that, after wading through nearly six hundred pages,\* it seems impossible to comprehend the scientific principles, upon which the author intended to build his doctrine. From these strictures, it ought not to be inferred, that we wish to detract from the merits of the excellent poet, who has so elegantly sung the “Loves of the Plants.” But justice forbids that, out of respect to character or reputation, one man should be allowed to assume to himself, any portion of that honour, which exclusively belongs to another. Science knows no personal distinc-

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\* At the time this was written, the first volume only, of Darwin's *Zoonomia*, appeared in India.



tions. The author of a grand discovery, is, at least, entitled to posthumous fame.

THE ORIGIN of this, like every other discovery of importance, has been attempted to be traced to hints thrown out by preceding authors. Even the visionary speculations of Cullen, have been mentioned, as the source, of some of its fundamental principles :—with just as much propriety might they be imputed to any ingenious suggestion in “ The life and Opinions of Tristram Shandy.” Upon the whole, it may with confidence be asserted, that this doctrine is, in all its parts, original, as it is undoubted true, and important in its application. And those, who are disposed to deny it this merit, should, in decency, adduce something like argument, instead of the ebullitions of vanity, detraction, or jealousy.

AFTER this eulogy, the reader may perhaps expect, that the following pages contain a mere verbal copy of Brown's *Elements of Medicine* ; but he will soon perceive, that this is not the case. For, although its fundamental principles are indisputably true, there are several errors in the detail, and some of them of very considerable importance. His opponents, however, if truth had been their object, should have endeavoured to perfect the doctrine, by a correction of its errors, instead of illiberally affecting, on ac-



count of partial blemishes, to reject the whole. To the candid, liberal, and enlightened, it will appear much less wonderful, that Brown should have some times erred, than that he should have been so pre-eminently successful, in first pointing out, to the world, the right path of medical investigation.

THE principal deviations, from the original doctrine, to be found in the following “ View of the Science of Life,” are these :

1st.—It is demonstrated, that diseases of excessive excitement cannot exist ; and that all those, which have been so called, are diseases of indirect debility.

2dly.—ALMOST the whole of the diseases, which were ranked, by Brown, and his followers, among the diseases of direct debility, are shewn to be diseases of indirect debility.

3dly.—IN the mode of applying the exciting powers, for the cure of diseases of indirect debility.

FROM this statement, it appears, that the alterations, here made in the doctrine, as they affect the method of cure, in more than one half of the diseases, to which living bodies are subject, are of the first importance ; and therefore deserve a candid examination.



It may be proper to remark, that some persons have affected to reject this doctrine, upon the very grave and solemn ground, of its being favourable to intemperance. To those however, who will take the trouble of making themselves acquainted with its principles, it will only be necessary to observe, that such persons do not understand the subject.

IN climates and countries where the transition, from health to disease, and from disease to death, is often alarmingly rapid, and health always precarious, the knowledge of a doctrine, which reduces the practice of medicine to a degree of certainty hitherto unknown, cannot but be attended with great and evident advantages. To diffuse that knowledge in India, where the doctrine seems to have been but little cultivated, and to have acquired but a small degree of reputation so justly due to it, is the design of this undertaking. The attempt is made with the greater confidence, from having experienced, in the application of the principles to practice, a degree of success, far beyond even the most sanguine expectations, that had previously been formed in theory. If, however, this confidence should not, after a fair investigation, be justified by the experience of others, the subject remains open for free dis-



cussion, by which alone the doctrine must, finally, be either confirmed, or refuted.

As it is, for obvious reasons, desirable, that a knowledge of medical science, should not be exclusively confined to medical men, we have entirely divested our observations of the mysterious garb, in which such knowledge is usually conveyed to the world.

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V I E W  
OF THE  
SCIENCE OF LIFE.

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C H A P T E R I.

FUNDAMENTAL PROPOSITIONS.

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I. — **A**LL living bodies possess a certain property, capable of being acted upon by external powers, so as to produce the phœnomena of life.

THIS property is denominated **EXCITABILITY**.\*

II. — **T**HE external powers are all such objects as, applied to the whole, or a part of any living body, are capable of acting upon the excitability.

**T**HEY are denominated **STIMULI**, or **EXCITING POWERS**.

III. — **U**PON the application of the exciting pow-

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\* Some recent modifiers of this doctrine, are of opinion, that the exciting powers act upon the muscular fibre only; and therefore use the term **IRRITABILITY**. But as the powers which produce, as well as those which remove disease, evidently affect the whole body, we think it safer to retain the more comprehensive term, adopted by the original author.



ers in a due, deficient, or excessive degree, depend the different states of the excitability.

IV.—UPON the different states of the excitability depend all the phænomena of health, and disease.

V.—THERE are three states of the excitability.

1st.—THE state of ACCUMULATION.—When a portion of the usual stimuli is withheld, the excitability accumulates; and the body becomes susceptible of impression, in the direct ratio of the subduction.

THIS state constitutes diseases of ACCUMULATION, or of DIRECT DEBILITY.

2dly.—THE MIDDLE state. When the excitability is such, that the application of the accustomed degree of exciting powers, produces TONE, or HEALTH.

3dly.—THE state of EXHAUSTION. When the application of stimuli, has been greater than that which produces healthy action, the excitability is exhausted; and the body becomes less susceptible of impression, in the direct ratio of the access.

THIS state constitutes diseases of EXHAUSTION, or of INDIRECT DEBILITY.



VI.—THE states of accumulation, and exhaustion of the excitability, in their different degrees, constitute all the diseases, to which living bodies are subject.

VII.—DISEASES differ from each other, only in the degree of accumulation, or exhaustion of the excitability in the whole, or parts of the body.

VIII.—CONSEQUENTLY, as two degrees of the same state, or two different states of the excitability, cannot take place at the same time, in the whole, or any particular part of the body, two diseases cannot possibly co-exist, in the whole, or a particular part.

IX.—THE cure of all diseases depend upon an application of stimuli, in a degree proportionate to the accumulation, or exhaustion of the excitability.

X.—THE degree of power, with which the functions of life are performed, is expressed by the term EXCITEMENT. Thus, there is a healthy excitement, when the functions of life are justly performed. But in proportion as a deviation from health takes place either in direct or indirect debility, so the functions of life are performed with less power, or the excitement is diminished.



## CHAPTER II.

OF STIMULI, OR THE EXCITING POWERS.

---

XI.—ALL objects in nature, capable of producing an effect upon living bodies, are stimulant, (11.)

XII.—STIMULI, may be divided into ordinary, and extraordinary.

1st.—ORDINARY stimuli, are all such powers as are usually applied to living bodies, in a state of health.

2dly.—EXTRAORDINARY stimuli, are such as are occasionally applied to living bodies, as noxious, or may be used, as curative powers. Of this description are all the active substances that are or may be employed as medicines, whether animal, vegetable, or mineral.

SUBSTANCES usually called POISONS, as their deleterious operation depends wholly upon their superior degree of stimulant power, ought not to be distinctly considered. Any stimulant, when exhibited in sufficient quantity to exhaust the excitability, acts as a poison.



CONTAGION has been enumerated as a cause of pestilential diseases. But as the existence of such a power is by no means proved, it ought not to be admitted in philosophical disquisitions. The grounds of dissent, from an opinion so universally received, will be fully explained in another place.

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### CHAPTER III.

APPLICATION OF STIMULI, OR THE EXCITING POWERS,  
FOR THE CURE OF DISEASES.

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#### 1. *Diseases of direct Debility, or of Accumulation.*

XIII. As the body becomes susceptible of impression, in the direct ratio of subduction of stimuli (v. 1.), it follows that the force of stimulus to be applied, in the cure of diseases, of this state, should be inversely as the accumulation of the excitability. Thus in the case of persons who have been exposed to great degrees of cold, heat should be applied, first in a degree not much greater than the lowest temperature, to which the person has been exposed, and gradually increased to the usual standard. To frozen limbs, the



first application should be snow, then cold water, afterwards water less cold, and so on, through the various degrees, until motion and sensation are fully restored. Whereas, by the immediate application of the accustomed degree of heat, death would be produced in the whole, or those parts of the body, which had been exposed.—To persons who may have remained long without food, nourishment should be exhibited in the same gradual manner. The quantity usually taken at a meal would, in such a case, instantly extinguish life,—a fact of which there are many instances upon record. The eyes of persons, who have been long kept in darkness, become exceedingly sensible to the smallest degree of light. Those unfortunate beings, whom the mistaken and perverse policy of man has doomed to long confinement in dungeons, become, in the course of time, capable of distinguishing all the corners of their gloomy abode ; where, upon their first entrance, they could distinguish nothing. The impression of the full glare of a meridian light, upon organs in such a state of susceptibility, would occasion instant and irrecoverable blindness. A person, suddenly awoke in the night, can scarcely bear even the small degree of light, emitted from a common candle. It is only by the gradual approach of day, that the eye is enabled to bear the full force of the mid-day sun.



SCURVY seems to be a disease of direct debility, occasioned by the absence of some of the usual exciting powers, particularly nutritive food, heat, and the mental stimuli. These powers must be gradually applied, in order to re-produce health. Upon this principle it is, that vegetables and vegetable acids, as being less stimulant than fresh animal food, are found so useful in the cure of scurvy. An immediate indulgence in the latter, after a long abstinence, would produce dangerous consequences. In advanced stages of this disease, a very small quantity of stimulus, such as a glass of ardent spirits, or a strong mental impulse, has been frequently known to extinguish life. That diminution of heat has a share in the production of scurvy, is evident from its more frequent occurrence in cold, than in hot climates. And that the absence of the mental stimuli, is often a source of this disease, is obvious from this,—that every circumstance that can occur, during a long voyage, calculated to rouse the mind to moderate exertion, will produce an alleviation of the symptoms;—the sight of an enemy—the sight of land—approach to the destined port—the anticipation of the pleasures of the shore, &c. This is farther corroborated by the frequency of scurvy among the enslaved Africans, in their passage to the West Indies, where all the mental stimuli are as completely abstracted, as can be supposed to happen in almost any



possible situation. The disease in this case affects the men, more than the women and children. The reason is evident. With men, the transition from liberty to slavery, is greater than with women and children, accustomed, in their most free state, to look up to them as their superiors. The minds of the latter too, from being less exercised, are the less capable of reflection, and become more easily reconciled to their new situation; which is also rendered less irksome, by the indulgence usually granted to them, even on board of ships, employed in the vile traffic of slaves.

THE absence of those objects, which were wont to excite pleasurable sensation in the mind, produce diseases of this state.—Such is the despondence of a lover, in the absence of the object beloved: and that melancholy, with which some persons are affected, when absent from their native country.

XIV.—As the situations, in which the ordinary stimuli can be withheld, in any considerable degree, are rare, the diseases of this state are consequently few in number; and seldom become objects of medical treatment.

XV.—IN all of them, the cure consists in a gradual re-application of those exciting powers,



the abstraction of which occasioned the disease; or, in situations where that is impracticable, by a similar application of other powers equivalent in force.

*2.--Diseases of indirect Debility, or of Exhaustion.*

XVI.—As the body becomes less susceptible of impression, in the direct ratio of the excessive application of stimuli (v. iii), it follows that the force of stimulus to be applied, in the cure of diseases of this state, should be directly as the exhaustion of the excitability.

XVII.—As all diseases arise, either from accumulation or exhaustion of the excitability, (vi.) and as the diseases of accumulation have been shewn to be extremely few (xiv), diseases of indirect will probably be to those of direct debility, in some such proportion, as nine hundred and ninety nine to one. The diseases of warm climates may be considered, without exception, as diseases of exhaustion, or of indirect debility.

XVIII.—As the highest excitement is the greatest degree of health, it is evident that, in disease, health is to be reproduced, by the application of such a degree of stimulant power, as is calculated to support the highest state of excitement, of which the body, at the time, is



capable. Let the middle state of the excitability for instance, be represented by 20, and the appropriate degree of stimulus, producing healthy excitement, by 20 also (vide Table) ; let the diminishing or increasing sum of stimulus, in proportion to the accumulation or exhaustion of the excitability, be represented by numbers, as in the annexed table. If the excitability is exhausted to 10, the sum of stimulus to be applied, in order to produce the greatest excitement, which the state of the body will allow, will be as 30. Every degree of stimulus, beyond that, will exhaust the body still farther, and every degree, below it, will retard the cure. Thus 35 degrees of stimulus will be too much, 25 too little.

XIX.—As the production of the healthy state is always gradual and progressive, and is effected by the powers of life ; it follows that, in proportion to the degree, in which these powers can be maintained, the cure will be accelerated. There is no other mode of supporting them, but by an application of stimuli, proportionate to the susceptibility of impression.

XX.—As the sum of the powers, producing disease, cannot possibly be ascertained, the degree of stimulus to be applied, for the reproduction of health, must be entirely regulated by observation



of the effects, arising from the application of medicines.

XXI.—As the varieties of diseases that occur, from the highest degree of accumulation, to the lowest degree of exhaustion, of excitability; so is the variety, in the degree of stimulus, necessary to be applied, for the cure.

XXII.—THIS variety is of very great extent. The usual mode, therefore, of prescribing certain fixed doses of medicines, in every disease, whatever may be the degree of it, is and must be nugatory and inefficacious; excepting when these doses happen, by mere chance, to correspond with the state of excitability.—In ascertaining these degrees, and proportioning the stimuli, consist the judgment of the physician.

XXIII.—If, for example, opium, æther, volatile alkali, the preparations of mercury, wine, bark, &c. exhibited in the usual doses, do not produce effects, which indicate an approximation to health,—such as a diminution of frequency,\* and an increase of strength, in the pulse, a coolness of the skin, moisture of the tongue, refreshing sleep, and the other familiar signs of increas-

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\* There is sometimes a peculiar slowness, which is equally a sign of debility, with a quickness of pulse. Vide Case 8th.



ing excitement,—it is evident that the doses are insufficient, and should be increased, until these effects are produced.

XXIV.—THE doses should be repeated in such a manner, as to maintain the highest degree of excitement, of which the body, at the time is capable. But in proportion as the excitability accumulates, or the body approaches to the state of health, the doses should be gradually and proportionally diminished, until at length, health being established, nothing more than the action of the ordinary exciting powers is required.

XXV.—ALL the diseases enumerated by Brown, as diseases of accumulation or direct debility, with perhaps the single exception of scurvy, are diseases of exhaustion. Typhus, Intermittents, Dysentery, and some other diseases, as they appear to be occasioned by exposure to cold, and moisture, a deficiency of nutriment and of other stimuli, have been ranked, by him, in the class of diseases of accumulation. But as the sum of the powers, which are concerned in the production of any particular disease, cannot be ascertained, the nature of it can only be determined by the effects of the stimulant powers, applied for the cure. And, as the cure of these diseases depends upon the application of the most powerful stimuli, it necessarily follows that, they are diseases of indirect debility.



THIS error seems to have arisen from an opinion, that upon the abstraction of stimuli from (or in the words of Brown, the application of directly debilitating powers to) a body in a state of exhaustion, the irritability would accumulate; or that direct would be superinduced on indirect debility. But this opinion is evidently erroneous. If from a person labouring under plague, malignant fever, or gangrenous sore throat, all the usual remedies are withheld, and only cold water given, no accumulation of the excitability will take place; but on the contrary, the exhaustion will rapidly proceed, to the extinction of life. If a person, previously exhausted by exposure to excessive heat, drinks largely of, or plunges himself into cold water, the exhaustion will not be removed; but on the contrary, those greater degrees of it produced, constituting Tetanus, Spasms of the stomach, &c. And that these are all diseases of indirect debility, the mode of cure, which consists in the application of a very high degree of stimulant power, is a sufficient proof. Gout is a familiar instance in point. The state of body liable to this disease, is produced by a long continued application of food and drink, stimulant in too high a degree. Let a gouty person be exposed to cold and moisture, and a paroxysm will readily be produced. Let him suddenly refrain from his usual quantity of



food and drink, his stomach or head will be affected; and the most powerful stimuli, as *Æther*, Brandy, &c. will be requisite to relieve him.

XXVI.—HENCE it follows that, in diseases of exhaustion, the irritability does not accumulate upon the abstraction of stimuli; but on the contrary, the state of exhaustion is, thereby, increased.

XXVII.—IT follows also that, in the production of Typhus, Intermittents, Dysentery, and such other diseases as have appeared to arise from exposure to cold, moisture, &c. and have therefore been ranked by Brown, among the diseases of direct debility, the body must have previously been in a state exhaustion. By a subduction of exciting powers, from a body in such a state, the previous degree of exhaustion must be increased, and the diseases of that state consequently induced.

XXVIII.—MOST of the diseases of exhaustion appear to be produced in this manner.

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#### CHAPTER IV.

OF DISEASES DENOMINATED BY BROWN, DISEASES OF EXCESSIVE EXCITEMENT.\*

XXIX.—As there are three states of the excitability, (v. 1, 2, 3) so there are three corresponding states of excitement.

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\* Vide Lynch's Table, prefixed to Beddoes's edition of Brown's Elements of Medicine.



1st.—THE state of diminished excitement, from a *deficient* application of stimuli, corresponding with the state of accumulation, or direct debility.

2dly.—THE state of high excitement, from a *due* application of stimuli, corresponding with the middle state of the excitability or health.

3dly.—THE state of diminished excitement, from an *excessive* application of stimuli, corresponding with the state of exhaustion, or indirect debility.

XXX.—ALTHOUGH the stimulant powers may be applied, in an excessive degree, to the middle or healthy state of the excitability, it is evident that excitement never can be excessive; for every degree of stimulant power, greater than is necessary to produce health, must occasion a degree of exhaustion proportionate to the excess, (v. 3); and every degree of stimulant power, less than is necessary to produce health, must occasion a degree of accumulation, proportionate to the deficiency. (v. 1.)

XXXI.—THERE are, therefore, no diseases of excessive excitement. From whence it follows that those, which have been so denominated by Brown, must be diseases, either of direct, or indirect debility (vi.)



XXXII.----THAT they are all diseases of indirect debility, seldom constituting a very high degree of exhaustion, is proved, both by the powers that are known to induce them, and the remedies that are found most successful in their cure.

CATARRH, pneumonia, acute rheumatism, and other diseases of this class, are occasioned by the application of a considerable degree of heat, after the body has been previously exposed to cold ;—or *vice versa*. The temperature of warm rooms is, in general, greater than is sufficient to support healthy excitement. If the body therefore has been previously exposed to a considerable degree of cold, the irritability must be accumulated (v. 1) ; and the application of a high degree of heat, to a body in that state, must inevitably produce exhaustion.

IF, on the contrary, a person has been previously exposed to a degree of heat, beyond what is necessary to support healthy excitement, and cold be suddenly applied, the same effects will be produced (xxv.)—In most of these diseases, a local affection takes place, which evidently arises, from some parts being more exposed to the exciting powers, than other parts of the body ;—as the mucous membrane of the nose and fauces, in



catarrh ; the bronchiæ and lungs, in pneumonia ; and the extremities, in rheumatism. The mode in which the cure of these diseases is effected, viz. by warmth, small quantities of opium, wine, &c. and the application of fomentations, rubefacients, and blisters to the local affection, is a proof that they are diseases of indirect debility.

THE langour, inability to motion, want of appetite, nausea, costiveness, &c. which occur in these diseases, are evidently incompatible with such a state, as that of excessive excitement. Could such a state possibly exist, the functions of the body would be invigorated, in the exact degree of the excess.

IN convalescence from these diseases, it is well known, that a greater degree of nutritious food, wine, and other stimuli, are necessary, than in a state of health. But if they depended upon a state of excessive excitement, the cure could not otherwise be effected, than by persevering in an abstraction of stimuli, until health was re-established. The exhibition of stimulant powers would produce an increase of disease.

SMALL-POX and measles are of this kind, and to be cured only by stimulant powers.

THE mode in which Brown fell into error, in



considering some diseases as depending upon a state of excessive excitement, was probably this. Having still, (altho' contrary to one of his own fundamental principles "that all powers applied to living bodies are stimulant,"—in other words "that there is not a sedative in nature,") retained an idea, that those medicines, called evacuants, are debilitating ; and having found that, under a moderate application of them, together with the other parts of the usual treatment, patients generally recovered from these diseases, he was led to conclude, that they depended upon a state of excessive excitement.

THE mode of action, however, of those medicines, seems to have been universally misunderstood. As all objects, capable of producing an effect upon living bodies, are stimulant (x), those which produce evacuations must necessarily be included. If a certain quantity of calomel, infusion of senna, salts, or any other cathartic medicine, be taken, its immediate effect, like that of opium, camphor, or any other acknowledged stimulus, will be an increased strength of pulse, a sense of general invigoration, and all the usual symptoms of increased excitement, in proportion to its degree. And this will continue as long as the operation of the medicine. If the dose is sufficient to produce a high degree of excitement,



a discharge of natural fœces, when these have previously been long retained, will be the consequence. Is there any other mode, by which the intestines may be made to perform their functions, and to expel their contents, but by increasing their excitement? Certainly not—But if a greater quantity be given than is necessary, to enable the intestines to expel, with facility, their contents, a new disease is produced;—indirect debility is established; and a discharge of mucus, and sometimes of blood, accompanied by disagreeable sensations, follows; symptoms which are only to be removed by opium, and other stimuli.—It is not therefore with an intention of evacuating, that those medicines should be given. In diarrhœas, and incipient dysentery, where the intestines are evidently in a state of indirect debility, calomel, castor oil, and all the other medicines called cathartics, instead of increasing, invariably diminish the number of evacuations; and, by a judicious repetition of the doses, cure the disease. Those medicines, therefore, do not effect cures, by their EVACUANT, but by their STIMULANT POWERS.

As opium, æther, volatile alkali, wine, &c. when given in an improper manner, diminish; so the medicines, usually denominated evacuants, when given in a proper manner, increase the excitement.



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## CHAPTER V.

### LOCAL DISEASES.

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XXXIII.—THE principles laid down in the preceding pages, respecting diseases, which affect the whole body, equally apply to those, which effect only a part.

XXXIV.—As diseases, which affect the whole of the body, depend upon, either accumulation or exhaustion of the excitability (vi.) ; the same law must apply, with equal force, to any of its parts, separately considered.

XXXV.—IF that proposition (vi.) be true (as it undoubtedly is) it follows, that local diseases never depend upon a state of excessive excitement. Inflammation, therefore, a local disease of the most frequent occurrence, does not, as has been generally supposed, depend on such a state ; but, like the diseases of the whole body, which have been denominated by Brown, diseases of excessive excitement, and by others inflammatory, is, on the contrary a disease of diminished excitement, from indirect debility ; excepting in the single case of inflammation, produced by the exposure of any particular part of the body to a high degree of cold. As this proposition is of considerable importance, it may be necessary to enlarge upon it. The symp-



toms of local inflammation are heat, pain, redness, swelling ; and, in secreting surfaces, an increased secretion. It is evident that, in inflammation, an enlargement of the vessels takes place without a proportionate degree of contraction ; and that an increased quantity of blood flows into them.---As the effect of stimuli, upon the muscular fibre, is to produce contraction ; and as the blood is the appropriate stimulus of the arteries ; it is evident that, if these were diseases of excessive excitement, an increased contraction of the vessels, or a diminution of their diameters, in proportion to the increased quantity of the blood, would take place. If the vigour of a muscle is ascertained, by the force of its contraction, it is clear that every increase of vigour should be attended with an increased force of contraction. If local inflammation, therefore, was a disease of excessive excitement, there would be a diminution, instead of an increase, of the quantity of blood, in the vessels of the part. But that there is actually an increased quantity of blood, in the vessels of the parts inflamed, is evident in ophthalmia, and those inflammations, which are produced, in the course of experiments, upon the transparent membranes of animals. The same idea too is farther confirmed, by the mode of cure, which is universally adopted, and found successful, in those diseases.



The application of blisters, and inhalation of warm steam, in pneumonia, catarrh, and inflammatory sore throat; of vinegar, and ardent spirits, in burns, and scalds; warm fomentations, and poultices, in phlegmon; solution of volatile alkali, tincture of cantharides, and the different preparations of camphor, in the inflammation of the joints, in acute rheumatism; tincture of opium, and solutions of corrosive sublimate in ophthalmia; —are all so many proofs of the truth of this proposition.

XXXVI.—IN catarrh, pneumonia, acute rheumatism, phrenitis, and those other diseases of indirect debility, which have been called diseases of excessive excitement, the local affection, which arises from the parts being more exposed to the action of the exciting powers, differs from the general, only in being greater in degree.

XXXVII.—IN local, therefore, as well as general disease, the causes which produce, and the powers which cure them, tend equally to prove, that a state of excessive excitement cannot possibly take place, either in the whole, or any part of the body; and that the diseases usually considered as dependent upon such a state, are almost, without exception, diseases of indirect debility.



XXXVIII.—LOCAL diseases, like those of the whole body, are to be cured by an application of stimulant powers, in a degree proportioned to the state of the excitability.



# T A B L E

OF PROPORTIONS TO BE OBSERVED IN THE APPLICATION OF *STIMULI* TO THE *EXCITABILITY*.

Diseases of accumulation, in their various degrees.	40 or Death		Degrees of stimulus to be applied, to produce the greatest possible excitement.
	39 —	1	
	38 —	2	
	37 —	3	
	36 —	4	
	35 —	5	
	34 —	6	
	33 —	7	
	32 —	8	
	31 —	9	
	30 —	10	
	29 —	11	
	28 —	12	
	27 —	13	
	26 —	14	
	25 —	15	
Small degrees of accumulation, not constituting what is commonly called disease.	24 —	16	Appropriate degrees of stimulus.
	23 —	17	
	22 —	18	
	21 —	19	
Middle state of the excitability.	20 —	20	Appropriate degrees of stimulus, producing healthy excitement.
Small degrees of exhaustion, not constituting what is commonly called disease.	19 —	21	Appropriate degrees of stimulus.
	18 —	22	
	17 —	23	
	16 —	24	
Diseases of exhaustion, in their various degrees.	15 —	25	Degrees of stimulus to be applied, to produce the greatest possible excitement.
	14 —	26	
	13 —	27	
	12 —	28	
	11 —	29	
	10 —	30	
	9 —	31	
	8 —	32	
	7 —	33	
	6 —	34	
	5 —	35	
	4 —	36	
	3 —	37	
	2 —	38	
	1 —	39	
	0 or Death.		



☞ EXPLANATION *of the* TABLE.

THIS Table is meant merely to convey a general idea of the manner, in which stimuli should be increased, or diminished, in proportion to the exhaustion, or accumulation of the excitability. It is not supposed, that the degree of the excitability, or the proportion of stimulus represented by the figures in the table, can be ascertained in any other manner, than by observation of the effects produced by their application. The range of figures, is by no means sufficient to express the various degrees of accumulation and exhaustion of the excitability, that can take place, between the middle state and death. It will however, be sufficient to give a general idea of the mode of cure, deducible from the principles laid down in the preceding pages.



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# C A S E S,

*By Dr. R A T E S.*

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## C A S E I.

**F**RANCIS LOTE, aged 35, was admitted into the General Hospital, at Calcutta, on the 1st of May, 1796.—At that time, he complained of general pains over his body, with all those symptoms which indicate an exhausted constitution. On the 15th of May, he came under my care. At that time I found his mouth sore, from the use of Mercury; and he was much purged and griped. On the 3d of June, when I discontinued attending him, his complaints were considerably relieved, by the use of Opium. On the 21st of August, he again came under my care, in a state of extreme debility, with excessive purging, and bloody stools. During the whole of this time, he had remained in the Hospital; but, from necessary arrangements, had fallen, during intervals, under the care of other



gentlemen. During the last of these intervals, he was so extremely weak that, in the act of vomiting, the right clavicle was fractured, which occasioned much pain. On that and the two successive days, I gave him eighty drops of Tincture of Opium, morning, and evening. On the 24th, in the morning, as no effect seemed to be produced by the medicine, it was ordered to be given three times a day. At one o'clock P. M. the same day, I was called to him; and found him complaining of violent pain in the bowels, with incessant purging. He had taken the 2d draught about an hour before. The draught was ordered to be immediately repeated. At 9 P. M. he was not relieved; upon which 150 drops of Tincture of Opium was prescribed immediately and ordered to be repeated at 12 o'clock. A glyster, with 200 drops of Tincture of Opium was also given. On the 25th he was easier. The glysters, with 200 drops of Tincture of Opium, were continued every three hours, and the draught, with 150 drops, was repeated in the evening. On the 26th, in the morning, he was nearly in the same state; the glysters were continued, and the draughts ordered 3 times in the day. At 9 P. M. I found that the relief from the glysters, was merely temporary, that he had stools every hour, and no inclination to sleep. Four hundred drops of Tincture of Opium were



ordered in glyster, every two hours, and a fourth draught of 200 drops to be taken at 12 o'clock. On the 26th he was easier; he had six or seven stools in the night, with less griping. Slept better than he had done, since he came to the Hospital. His pulse beat about 90 strokes in the minute; previous to this his pulse had been very quick and small, but the state of it was not particularly noted; he had 150 drops of Tincture of Opium in the morning, and 200 at 12 o'clock. Four hundred drops were ordered in glyster, every three hours. One P. M. He had 5 stools since morning; the glysters were continued; and a draught of 200 drops ordered to be taken at 4 o'clock. At 8 P. M. he had 13 stools since the last visit, with a good deal of pain in his bowels. He had not slept; was ordered a draught of four hundred drops of Tincture of Opium at ten o'clock. August the 28th, he had slept a little the preceding night; bowels were easier; pulse 80; had draughts of 200 drops every two hours, with the glysters occasionally. At 2 P. M. his pulse was 90; he was in other respects as before: had taken three draughts. The draughts of 200 drops were repeated every hour. At 9 P. M. his pulse was still 90; he had dosed much, but had no sound sleep; he had taken 4 draughts. A draught of 400 drops was ordered to be given



at 12 o'clock. On the 29th, his pulse was 80, and strong; he had 3 stools, with less pain; but slept little; the draughts of 200 drops were continued every hour.—2 P. M. had incessant stools since morning, with violent pain of the bowels; glysters of 400 drops were ordered every hour. 8 P. M. had four stools since 2 o'clock; had taken only one draught; his bowels were easy after the glysters; pulse 112.—Eight draughts, with 200 drops each, were ordered to be placed at his bed-side, of which he was directed to take one every hour, during the night, with glysters of 500 drops every hour, in the intervals between the draughts.—30th, had six stools during the night. He was free from pain, and his pulse 80 and full; the draughts were continued every two hours, and the glysters occasionally. 9 o'clock P. M. he had eight or ten stools since morning, with some griping; pulse 90. The draughts were increased to 300 drops every two hours; and the glysters continued.—31st, had passed a good night; his pulse was 90; he had five stools; his medicines were continued as the day before. In the evening, he was nearly the same; no alteration was made in his medicines—September the 1st, he had six stools during the night, with griping: did not sleep; had no blood in his stools; for two days; the draughts of three hundred drops were given every hour, and the glysters of five hundred drops were conti-



nued as before, and repeated according to his own discretion, as the tenesmus and griping might indicate.—8 P. M. he was much worse ; had eight stools during the day, and no sleep ; his pulse was 120, and he was so extremely weak, that I considered him as approaching to dissolution. Draughts of 500 drops each, were ordered to be given every hour, and the glysters of 500 drops, to be continued as before.—2d, he had not slept, but felt himself better ; pulse 104 ; his medicines were continued, in the same manner during the whole of that day. On the 3d, his pulse was 100 ; he had slept well the preceding night ; his medicines were continued. On the 4th, he was much better, had dosed much, and had only two stools ; the draughts were directed to be taken occasionally, as circumstances might indicate—This plan was continued until the 14th, at which time his mouth became sore, and the flow of saliva was increased, as if he had been using mercury. The draughts and glysters were, from that period, ordered to be repeated occasionally, according to his own discretion. On the 22d, the discharge of saliva continued in the same state.—On the 26th, he was better ; and his bowels easy.—29th, he continued without pain, with two or three stools in the day, and his strength increasing. On the 30th, when I discontinued attending him, he had only two stools in the



day, without pain ; and felt a returning appetite. Being a sensible and steady man, he was, at that time, allowed to proportion the strength and frequency of the draughts and glysters according to his own judgment.—During the whole of the time that he was under my care, he had an allowance of wine from one to two or three bottles in the 24 hours, according to exigency.—From his good sense and punctuality, I have a perfect reliance upon his having conformed to my orders, in every particular, as far as it is possible for patients, in an hospital, to do.

THE treatment of this case may give some idea of the manner in which stimuli should be increased, in diseases of great exhaustion, until the quantity is ascertained, which is capable of producing the highest degree of excitement. It will shew the very great quantity of the most powerful stimuli that may be necessary, in some diseases of that state, in order to effect a cure ; and is also an example of the mode in which the doses ought to be repeated. The foreness of the mouth, and the increased flow of saliva, evince that there is a greater similitude between the action of opium and mercury, than has yet been acknowledged. The foreness of the mouth and spitting commenced, after the quantity of opium was diminished. Upon resuming the draughts, the mouth became less sore,



and the flow of salava decreased ; and upon leaving them off, the soreness and spitting increased. This was repeatedly remarked by the patient himself. It should be observed, in order to prevent a rash imitation, where the circumstances are not alike, that the tincture of opium employed; upon this occasion, was much weaker than what is usually made in Europe ; that a very great degree of exhaustion had taken place ; and that the doses were gradually increased, from eight drops to five hundred.

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## C A S E II.

—DE HAES, aged 40, was admitted into the General Hospital, at Calcutta, on the evening of the 26th of August, 1796, with dysentery of eight days standing. He had about 30 stools in the day, containing slime, mixed with blood ; and complained of much pain in his bowels. His pulse was 90 in the minute. At 9 o'clock P. M. he was ordered to rub in, half an ounce of Mercurial Ointment, with half a drachm of Calomel, and to take a hundred drops of Tincture of Opium, to be repeated at 12 o'clock—27th, the Ointment was omitted by neglect. He continued in the same state. Half an ounce



of Mercurial Ointment, with a drachm of Calomel, was ordered to be rubbed in immediately, and repeated at 12 o'clock. A hundred drops of Tincture of Opium was desired to be given every two hours.—1 o'clock P. M. he had ten stools since morning, with blood and slime. Had taken only two draughts. The Ointment was ordered to be repeated at 4 o'clock, a glyster with two hundred drops of tincture of opium to be given every two hours, and one bottle of wine to be taken in the course of the evening—8 P. M. pulse 100. He had six stools with less pain. The ointment was rubbed in, and glysters were regularly administered. The ointment was ordered to be again repeated at 9 o'clock, the glysters to be continued, a draught of a hundred and fifty drops of tincture of opium to be given immediately, and to be repeated at 12 o'clock; and a bottle of Madeira to be given during the night.—28th, he had vomited several times during the night, but had only one stool; pulse 75. The ointment was ordered to be repeated, the glysters to be omitted, a draught with one hundred drops of tincture of opium to be given, and the wine to be continued.—2 P. M. pulse 72; vomited twice since morning; he had only two stools, and the pain was less; he slept a little. The ointment, draught, and wine were repeated.—9 P. M. pulse



84, had vomited twice, and had six stools. He complained of vertigo; the ointment was repeated, a draught of two hundred drops of tincture of opium was ordered to be given at 12 o'clock, and the wine to be continued.—29th, his pulse was 80 and full. He had ten stools, consisting of slime and blood. The ointment and wine were continued, and a draught, with one hundred drops of tincture of opium, ordered every two hours.—9 P. M. his pulse was 80, he had six stools, and frequent vomiting, particularly after taking the Maderia wine. The ointment was repeated, two hundred drops of tincture of opium ordered every two hours, and port wine to be given in lieu of the Madeira.—30th, pulse 74. He had two stools, vomited only once, and slept a little. The ointment and wine were repeated, and the draughts with two hundred drops, continued every third hour.—9 P. M. he had several stools in the course of the day, with much pain. No return of vomiting; pulse 100. The ointment was repeated with two drachms of calomel. Draughts of two hundred drops each, were ordered to be continued every two hours. The port wine became disagreeable to him, and Madeira was again given.—31st, pulse 84; had only two stools, and slept well. His mouth was a little sore. The ointment was repeated with one drachm of calomel, and the draughts



were continued every third hour.—9 P. M. pulse 80, he had eight stools. His skin and tongue were moist, and he began to spit a little. He had slept some during the day. The ointment, draughts, and wine were continued. September the 1st, pulse 76, he had only one stool, slept well, and was better in every respect. The ointment was repeated, with half a drachm of calomel; and the draughts and wine were continued.—8 P. M. continued better. He had no pains, excepting in going to stool. The discharge of salava was considerable. He had slept during the day. The ointment was omitted. A draught of two hundred drops of tincture of opium was ordered at 12 o'clock; and the wine was continued.—2d, he had only one stool during the night; pulse 68; the ointment was repeated without the calomel; and the wine continued.—8 P. M. he had slept during the day, and spit considerably; the draught of two hundred drops was repeated at 12 o'clock, and the wine continued.—3d, he had slept well, and had no stool; the ointment was entirely omitted; and the evening draught and wine were continued.—From that period the wine, and draughts occasionally, were continued until the 30th of September, at which time I left him in an advanced state of convalescence.



THE great quantity of mercury that was used, in this case, in conjunction with opium and wine, shew what a high degree of stimulant power may sometimes be required to effect a cure, in the state of exhaustion, which constitutes dysentery.

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### C A S E III.

JACOB MEYER, aged 35, was admitted into the General Hospital, at Calcutta, on the 23d of August, 1796, with pain of bowels and frequent stools. These complaints appeared at first to be slight ; and seemed for sometime, to give way to ordinary doses of calomel and opium. On the 29th he became worse ; and the same treatment was persevered in, but without effect. On the 1st of September, calomel and opium, of each two grains, every second hour, and a draught of eighty drops of tincture of opium, twice a day, were prescribed. The symptoms still increased in force. On the 3d, he had very frequent stools with violent pain in the bowels ; and could not bear the least pressure on the caput coli. His pulse was 132, thirst extreme, tongue furred ; and he had no sleep. Half an ounce of mercurial ointment,



and one drachm of calomel were rubbed in. The calomel and opium were given every hour. On the 4th his pulse was 120, he had vomited through the night, tongue brown and furred. The ointment was rubbed in, and to be repeated at 12 o'clock; the pills of calomel and opium were continued.—9 P. M. pulse 130; he had several stools during the day; tongue dry; he thought that he spit more than usual, but his mouth did not seem affected; one ounce of ointment and two drachms of calomel were rubbed in, and the pills were continued.—On the 5th his pulse was 120, he complained of violent pain in his bowels; the medicines were continued as the day before.—6th, his pulse was 100; he complained of violent pain on pressing the arch of the colon, had frequent stools with profuse perspiration, and appeared to be much alarmed and dejected; no increase of the quantity of saliva; the ointment and pills were continued in the same manner.—7 P. M. his pulse was 124; in other respects as before; he was immersed in the warm bath, and afterwards had one ounce of ointment, with half an ounce of calomel rubbed in; the pills were continued.—7th, pulse 112; complaints were nearly as the day before. He had an eruption upon the skin, such as usually appears, when salivation cannot be produced, after having used a large quantity



of mercury. The warm bath, with the ointment and calomel, were repeated ; and the calomel in the pills was increased to four grains.—8 P. M. pulse 128, he had incessant stools, accompanied by violent pains of the abdomen ; his tongue was brown and furred, and skin covered with profuse moisture. The bath was ordered to be repeated, and an ounce of ointment, with two ounces of calomel, to be rubbed in, immediately after the bath. A scruple of calomel and six grains of opium were ordered to be given every second hour—8th, pulse 112 ; he had incessant stools, with violent pain. He felt ease from the warm bath ; had taken five doses of the calomel and opium. The warm bath was ordered to be repeated three times in the day, the ointment and calomel to be again rubbed in, and the pills to be continued.—8 P. M. pulse 120, there was no increase in the quantity of saliva from the mercury, he had incessant stools with blood, and was extremely debilitated. Had taken six doses of the calomel and opium in the course of the day. Could not bear the least pressure upon the colon. The warm bath was ordered to be repeated, and afterwards two ounces of ointment, with four ounces of calomel, to be rubbed in. The calomel and opium to be given every hour—9th, pulse 112 and small. He had stools innumerable. The medicines were



continued. 9 P. M. his pulse was almost imperceptible, and extremities cold. The medicines were continued as far as circumstances would admit. 10th at 1 o'clock, A. M. he expired.

THE body of this patient was either not opened, or the appearances upon dissection were neglected to be noted down, at the time; and were consequently forgotten. But from the analogy between this case and all the others, in which the mouth could not be affected, in the usual manner, by mercury, there can scarcely be a doubt that the colon and rectum, if not the whole of the abdominal viscera were in a state of local disease. The cases of dissection, described by Mr. Maclean, will explain this point more fully. Of many cases of dysentery, and other diseases, that were opened by us, in which salivation could not be produced by mercury, there was not one without confirmed local disease of the viscera, either of the thorax or abdomen, or both.

THOSE, who may look upon the quantity of medicine here prescribed as extraordinary, should consider, that when a patient is evidently incurable, by the common practice, it becomes the duty of the practitioner to depart from it.



An opposite conduct is dictated, much more by a fly regard to reputation, than an earnest and conscientious desire of saving the lives of patients. Nothing can be more easy than to take shelter under customary forms.



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# C A S E S,

*By Mr. MACLEAN.*

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## C A S E IV.

EXTRACTED FROM THE JOURNAL OF THE ENGLISH  
EAST INDIA COMPANY'S SHIP NORTHUMBERLAND.

MR. ———, Cadet, aged 17,—tall, of a slender make, and consumptive habit ; June 13th, 1791, he had, since the commencement of the voyage, in April 1791, been much indisposed with sea-sickness ; for the last ten days, had feverish symptoms, and for two days a diarrhœa ; his skin was hot and dry, tongue foul and parched, pulse quick and small.—He was ordered to take two table spoonsful every hour of a mixture, consisting of a hundred drops of tincture of opium, and one pint of water, with an ounce of cinnamon water.—In the evening, there was a remission of the diarrhœa ; but it returned on the 14th, the mixture having been dis-



continued in the night.\* One grain of opium was ordered to be taken every hour.—15th, after having taken five pills, his skin became moist, his pulse full, he fell asleep (about 8 o'clock P. M.), and continued free from diarrhœa all night. He had perspired profusely, and his tongue and lips were less parched;—having complained of thirst, he was ordered wine and water for drink.—16th, the opium having been injudiciously discontinued on the 15th, all his symptoms returned; his tongue was foul and parched, his pulse quick and small, his skin hot and dry; he was considerably purged, and had much thirst; one grain of opium was ordered to be taken every hour.—On the 17th, the pills having been again imprudently discontinued in the night, he appeared rather confused, his strength was much exhausted, and his complaints remained the same. The pills were ordered to be repeated, and continued through the night.† He was allowed mutton or

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\* This subduction was improper. In every case, as well as in this, it will be found detrimental.

† The confusion of head, and other bad symptoms, which frequently follow the exhibition of opium, are, as I have uniformly observed, owing to the medicine not being repeated at proper intervals. In every case, which requires so high a stimulant power as that of opium, the exhibition of the doses should be regulated by principle.—They ought to be repeated in the night as well as in the day.—But the difficulty of doing this,



chicken broth, and fago alternately, as his fancy directed; and wine and water for drink.—18th, the pills were regularly taken, day and night, excepting in the intervals of sleep; his pulse was slower and more full: and he was in other respects better, but weak, his skin was covered with a healthy moisture; he complained of some foreness of his mouth and throat; he had eat some biscuit, soaked in tea, for breakfast, and was ordered fago for dinner and supper, the pills were continued.—19th, his pulse was stronger, an eruption appeared on his face, such as often happens after taking opium or mercury.—He complained that his mouth was very sore, and was ordered to have a gargle; the pills, &c. were continued as before.—20th, he was better, the pills, fago, &c. were regularly taken, and he drank plentifully of wine and water; his thirst was diminished; the pills and regimen were ordered to be continued as before.—21st, he was stronger, and declared himself in every respect better; the only complaints that remained were a foreness of the mouth and fauces,

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which may arise from the ignorance or carelessness of practitioners, the prejudices or obstinacy of patients, or the negligence of attendants, has often occasioned bad consequences, which have been erroneously imputed to the opium.



and some swelling of the face; the pills, &c. were continued.—22d, forenefs of the mouth and throat were troublesome; he spit more freely than usual, the increased flow of saliva somewhat resembling that which takes place after the use of mercury.\* He appeared in other respects so much better, that the pills were discontinued.† —23d, he had slept tolerably; but his skin was hot, and he complained of debility. No medicines were prescribed.—24th, slept ill, and was much harassed with a cough and spitting; his pulse was quick and irregular, and he was oppressed with clammy sweats,—half a grain of opium was prescribed every half hour, and bark in wine was given in the intervals. Regimen as before. From that period to the 27th, his medicines were punctually administered; his cough, spitting, and clammy sweats were diminished; his pulse, skin, and tongue were nearly in a healthy state; and the diarrhœa entirely stopped.—28th, he was stronger, had a good appetite, and

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\* I cannot say, at this distance of time, whether there was any ulceration of the gums, having omitted to notice it in the Journal.

† This is the third error that was committed in the treatment of this case, in suddenly withdrawing a stimulus, to which the patient had been for some time accustomed, and before health was completely re-established.



could sit up; his medicines, &c. were continued. After this, it was thought unnecessary to make daily reports in the Journal. His medicines were continued for some days, and gradually left off as he approached the healthy state.

IN the above case, the medicines were regularly given, either by a friend of the patient's, who took a particular interest in his welfare, by Mr. RIDGES, then surgeon's mate of the Northumberland, or by myself.—The relapses which always took place, upon suddenly laying the medicines aside, or with-holding them even for a night, shew the necessity of repeating the doses, with the utmost regularity and care. The soreness of the mouth, together with the increased flow of saliva, after the use of opium, was not a peculiar circumstance. Upon that subject, the following remark appears in my Journal:—  
“ In many cases, in which opium was freely given, for a length of time, a considerable increase in the flow of saliva, was observed to take place, and to continue long after the medicine was laid aside. But in cases, where a considerable spitting had before existed, opium as well as mercury had the effect of lessening it.” These facts, with the explanation of them, will be considered in another place.



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## C A S E V.

EXTRACTED FROM THE JOURNAL OF THE ENGLISH EAST  
INDIA COMPANY'S SHIP NORTHUMBERLAND.

ENSIGN G—, 36th regiment, a stout healthy man, about 25 years of age, went up, in a fit of playfulness, to the main-top-mast-head, on the evening of the 10th of June, 1791. After having remained there a short time, he fell asleep upon the cross-trees, and about mid-night fell down upon the quarter-deck. In the fall, he first struck with his hip, as was supposed, against an iron stauncheon in the main-top, which bent; he then came upon the mizzen-stay, which took him, as far as could be collected from the confused intelligence of some people upon deck, about the middle of the abdomen; and from the stay he fell upon the quarter-deck. He was, as may well be supposed, entirely insensible; much blood was discharged from his mouth, nose, ears, and even from his eyes; in this state he was carried down to his cabin; upon examination, no fracture was found; the whole consequences of the fall seemed to consist of contusions or concussion, the marks of which were very



general over his body. His pulse was small, but regular. There happened to be in the ship four professional gentlemen, besides myself. They all seemed of opinion, that Mr. G. should immediately lose blood. Some of them insisted upon it, with much earnestness; and the by-standers, knowing that to be the common practice, joined in urging a compliance. I replied, that, however common the practice might be, I was convinced of its being entirely wrong; and that I would not, even with the sanction of a majority, do what I was certain must endanger the life of my patient. But that if any of the gentlemen present, chose to take charge of Mr.—G, they might have an opportunity of bleeding him, with propriety, if convinced in their conscience that it was right; and I would give them my opinion when asked. This offer was not accepted. Mr. G. was not bled. In the course of two hours from the accident, he became sensible; was sick at stomach, and vomited. This, as a symptom of concussion usually enumerated, would farther indicate, according to the hypotheses of the schools, and the practice of hospitals, copious blood-letting. That, however, did not alter my plan. I was aware indeed that, if the patient died, his death would be attributed to the non-observance of customary forms. But I was



also persuaded that, if he lived, after having been copiously bled, it would be in spite of the blood-letting. He was my friend, as well as my patient; and in defiance of obloquy, I determined to do what appeared to me best, in order to save his life. Externally the most powerful stimulating substances were applied, in concurrence or succession. For four days he could not move in bed, without excruciating pain. He had small opiates occasionally, wine, and nourishing food; and once half an ounce of sal catharticus amarus, so as to produce one stool. Nothing more was done. He had not an unfavourable symptom. The pains gradually abated; and on the eighth day, from the fall, he was carried upon deck in a chair.

THAT there was absolutely a considerable degree of concussion in this case appears, from his having wholly lost the sight of one eye, although, when the marks of contusion had disappeared from that side of his face, the eye looked almost as well as the other. He complained at times of headach, which was always relieved by wrapping up his head in warm cloths.

THE issue of this, as well as of every other case of contusion or concussion, which I have seen treated, either in or out of hospitals, convinced



me, that blood-letting is not only unnecessary but pernicious. In private practice, I fear, a mean and criminal compliance with vulgar prejudice, in order to conciliate vulgar favour, too often influences practitioners, whose better judgments would lead them to reject intirely so deplorable a remedy :—a remedy of which the use is not only contrary to all principle ; but which, so far as I know, cannot adduce a single uncontrovertible fact, in proof of its utility.

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## CASE VI.

WILLIAM HOLLOWAY, aged 22, was admitted into the General Hospital, at Calcutta, on the 3d of September, 1796, with symptoms of typhus fever, of several days standing. At bed time, he took two grains of opium, and six grains of calomel.—4th, he had slept a little ; his tongue was parched and black ; pulse 96, he had two stools on the 3d. Six grains of calomel, and six grains of powder of jallap, were ordered to be given every four hours.—5th, in addition to his former symptoms, he complained of cough and pain of breast. He had only one stool, since he began to take the powders. The powders.



were ordered to be repeated, and a draught, with sixty drops of tincture of opium to be given at bed time.—9 o'clock, P. M. he had not yet taken the draught prescribed for him in the morning ; the pain of his breast was more severe ; he had no stool for twenty-four hours ; was ordered a glyster with one ounce of castor oil, and one ounce of Glauber's salts ; and afterwards to take the draught.—6th, he had no stool from the glyster. His pulse was 116 ; his tongue furred and black, and his mouth exceedingly parched ; he was a little confused, and had a slight degree of *subfultus tendinum*. Two ounces of the common infusion of senna was ordered every hour, and a glyster, double the strength of the former, every second hour until he should have a stool or two.—7 o'clock P. M. he had one copious stool, after having taken several doses of the infusion, and two or three glysters. Four grains of opium and four grains of calomel were ordered to be taken at 8 o'clock, and to be repeated at 12—On the 7th, he conceived himself better ; pulse 108 ; his tongue was still furred and skin hot. He was allowed twelve glasses of wine in the day. Ten grains of calomel, and fifteen grains of powder of jallap, were prescribed every four hours.—9 o'clock, P. M. his skin was very hot, pulse only 100 ; he had taken three of the pow-



ders, and had 3 stools ; he complained that his tongue was sore. It was still furred and black in the middle. He was ordered a draught, with a hundred drops of tincture of opium, at 8 o'clock, and again at twelve.—8th, his pulse was 100, and heat of skin more moderate ; but his tongue remained foul ; he expressed a wish for porter.\* A bottle of porter was allowed him ; —and the wine was continued. The powders and draughts were repeated.—9th, he remained nearly in the same state ; but complained of a severe cough. He had two stools. All his medicines were continued as the day before.—10th, he had no cough, and rested well ; his pulse was 112 ; he had no stool ; two ounces of infusion of fenna were ordered to be taken every hour through the day, and the draughts to be repeated at night.—11th, his pulse was 116, tongue very foul, and mouth parched ; he had slept but little ; and had no stool since the 9th.—A glyster, with two ounces of castor oil, and two ounces of Glauber's salts, was ordered to be given immediately, and to be repeated according to circumstances. The powders were given as before.—7 o'clock, P. M. his pulse was only 100 ; tongue

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\* The desire for beer or porter, is a symptom that frequently occurs, when the mouth begins to be affected, after having used mercury.



cleaner, and moist.—He had one stool after having taken two glysters. He remarked that he had, for the first time, a distinct paroxysm of fever in the afternoon. The draughts were given as usual.—12th, his pulse was 92, and his skin nearly of a healthy temperature ; his tongue remained a little furred ; he had no stool. The glysters, powders, and draughts, were directed to be given in the same manner as the day before.—13th, when I visited him, he was found asleep, seemed easy, and his skin cool. The medicines were ordered to be continued.—7 o'clock P. M. his pulse was 76 ; skin moist and cool ; he had two stools, and was inclined to sleep. The draughts were continued.—14th, he was not so well as the day before ; his pulse was 96 in the morning, and 92 in the evening, and his tongue rather foul. The medicines were continued. On the 15th, his skin, tongue, and pulse, approached nearly to the healthy standard. He expressed a desire to eat, and was ordered to have chicken broth. The powders and draughts were continued. On the 16th, he had no feverish symptom, his tongue was sore at the edges, and there was an increased flow of saliva. The powders were omitted, and the draughts continued. From that period, he was convalescent, and only took one draught occasionally at night. On



the 23d, he was free from complaint, and discharged from the Hospital.—During the whole of the time, he was allowed wine and porter, as at first prescribed.

THIS case is not given as an uncommon one, either in respect to the violence of the disease, or the quantity of medicines that were prescribed. The history of it shews, that the sum of stimulant power first applied, was inadequate to effect a cure, even in a case of slight disease; for the symptoms by no means approached to the severity of typhus gravior. In every fever, whatever be its nosological description, the same plan would have been pursued, increasing or diminishing the force of the exciting powers, in proportion to the degree of indirect debility. If such a quantity, as was used here, be necessary for the cure of mild typhus, what powerful stimuli must often be required in typhus gravior, dysentery, or plague?

THE intervals, I think, at which the medicines were repeated, are too long. The duration of the action of each dose of mercury or jallap is not, perhaps near so much as four hours—probably not more than one. But whatever it be, such is the period exactly, at which doses ought to be repeated.



IN this, as well as in many cases, both of dysentery and fever, I have given castor oil, jallap, and other cathartics, with a view simply to increase the excitement. In so far as they effect that, and thereby invigorate the functions of life, they are proportionally as useful as opium, æther, mercury, brandy, wine, or bark. But the purging I conceive to be proportionally as injurious a consequence, and as much a mark of indirect debility, as the headach, sickness, and vomiting, which follow an excessive or irregular use of these substances. This subject is considered at greater length elsewhere.

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#### CASE VII.

JOHN BROWN, aged 28, was admitted into the General Hospital, at Calcutta, on the 10th of July, 1796, with typhus fever—He had besides a sore leg, and chancres. His fever, although apparently slight, was very obstinate. In the course of two months, he was several times almost cured, by small and frequently repeated quantities of opium, mercury, wine, and bark, varied according to circumstances. But, seemingly in consequence of internal local affection, he as often relapsed, without any apparent cause. His fever,



from continued became remittent, and from remittent intermittent. On the 24th of September, suspecting the existence of local disease, I represented to him the necessity of undergoing such a course of mercury as to affect his mouth, to which he had hitherto expressed an insuperable aversion. He had, for some days previously, taken calomel in small doses; and had latterly two emetics, at his own request.\* On that day, he was ordered to take ten grains of calomel, and fifteen grains of jallap every four hours.—25th, he had taken three powders in the course of the day, and was exces-

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\* That tartar emetic is a stimulant of very high power is evident, from the small quantity of it, which produces the state of indirect debility, that occasions vomiting. It should be given in such a manner, as to increase and to support the excitement. But this will be found difficult, as the duration of its action seems to be even shorter than that of opium. If its action does not continue more than a quarter of an hour, might it not be repeated at such short intervals, and the doses so gradually reduced, as not to allow the establishment of indirect debility? If, when given at such a random rate, as to produce vomiting, and the most disagreeable sensations that can be imagined, medicines sometimes produce good effects, how much more useful must they be, when given according to just principles? The prejudices of patients may sometimes be turned to their advantage, by judiciously alternating stimuli, so as to humour their whims. The medical prejudices of the vulgar, are generally dictated by those of physicians. At present they are as unreasonably in favour of tartar emetic, as they are against opium.



sively purged and griped through the night†. He had no fever. Two grains of opium, and four grains of calomel were directed to be taken every three hours, through the day, and four grains of each at bed time.—26th, the same plan was continued; and he had no return of fever.—27th, he had no fever, and his mouth was very sore. The pills were ordered to be given every six hours.—28th, his head, face, tongue and throat, were much swelled; he had a considerable discharge of blood from the mouth and fauces, and some purging. In this case, the medicines were by no means correctly exhibited. But it is probable also, that they were not regularly taken. Salivation, or, in cases of local disease, where salivation cannot be produced, a discharge of blood from the mouth and fauces, does not take place, while the mercury is regularly taken, but when it is either suddenly laid aside, or given at improper intervals.\* The

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† This is one of many facts that prove purging to be the effect of a state of indirect debility, occasioned by the improper subduction of stimulant powers. Had the powders been regularly repeated in the night, the purging and griping would not have taken place. This I have observed so repeatedly with respect to calomel, that I have no hesitation in asserting it to be an undoubted fact.

\* Vide the subsequent cases, and the "Treatise on Mercury."



following mixture was prescribed—tincture of opium three hundred drops—water one pint—peppermint-water and sugar, as much as will make the mixture agreeable—an ounce of it to be taken every hour. The pills were omitted. On the 29th and 30th, he continued the mixture; his mouth was better; he had no fever, and but little purging; and his pulse was 86.—October the 1st, his pulse was 76, and of good strength; his mouth was much better; and he had no return of fever. The tincture of opium was diminished to two hundred drops.—From that period, he recovered strength, and had no return of fever. The mixture was gradually decreased in strength and discontinued. On the 16th of October, he was discharged, apparently well.

THERE are several inferences to be drawn from this case. The obstinacy of the fever convinced me, that it depended upon local disease, and determined me to give mercury in large doses. The discharge of blood from the mouth and fauces, without a previous increased flow of saliva, was an additional proof of the existence of internal local affection. And, altho' this patient left the Hospital apparently well, I am convinced, from the circumstances mentioned, as well as from an irregularity of his bowels, that his abdominal viscera were in a diseased state, and that his exemp-



tion from general disease was merely temporary. From these observations, I would not be understood to infer, that mercury acts as a *specific* in removing local disease; but that, by supporting the excitement of the whole body, it invigorates each particular part, and thus occasions, to a certain extent, the regeneration of those organs, which may have been injured by disease.

THIS is not the only instance, in which the good effects of opium have been experienced, where an excessive salivation, or a discharge of blood from the fauces, after the use of mercury, had taken place. As these symptoms happen from too sudden a subduction, or an irregular repetition of the mercury; so they may be either obviated or removed, by a proper application of the same power. But as the prejudices of patients will seldom admit of a continuance of the medicine, in these cases, it is absolutely necessary to substitute some other stimulant power, equivalent in force. Those which I have found to answer best, are opium blisters, and the warm bath. Other stimuli, justly proportioned, might no doubt answer equally well. But from the endless hypotheses of the art, no successful attempts have yet been made to ascertain their relative powers. This is a discovery, which, however distant, I am yet sanguine enough to expect.



For, in the medical as in the moral world, attachment to principles instead of persons, may be expected to increase, with the progress of knowledge.

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### C A S E VIII.

HENRY DOLLAWAL, aged 26, was admitted into the General Hospital, on the evening of the 22d of October, 1796. He had, for a fortnight before, complained of headach, pain of loins, hoarseness, and cough, &c. pulse 58. He was ordered to take two grains of opium and four grains of calomel, at 9 o'clock, P. M. and again at twelve.—on the 23d, he was somewhat easier. Pulse as before. He had no stool. One grain of opium and three grains of calomel, were given every three hours; and several glysters of castor oil.—9 o'clock P. M. he had one stool. The opium and calomel were desired to be repeated as the night before. Pulse 64.—24th, he thought himself better; but his cough continued severe. Pulse 56. He was desired to take four grains of colomel every three hours.—9 o'clock P. M. he was not sensible that the pills produced any effect. Four grains of opium and ten grains of calomel were ordered to be taken immediate-



ly, and repeated at 12 o'clock.---25th, he was seized in the morning with violent spasms. Pulse 64. He was put into the warm bath, which was ordered to be repeated according to circumstances. Afterwards, two grains of opium and four grains of calomel were directed to be taken every two hours, day and night.---26th, he was much better, and had no cough. The pills were continued.---27th, he thought himself better. His pulse beat only 44 strokes in the minute. The pills were repeated every three hours.---28th, his mouth was gently affected. Two grains of opium and two grains of calomel were given every three hours.---29th, he was in every respect better, had some slight spitting, and felt a returning appetite. Pulse 68.---One grain of opium and one grain of calomel were given every four hours.---On the 30th, he was discharged well.

AN uncommonly flushed countenance, and what is called a plethoric habit, together with an unusual slowness of pulse, hoarseness, cough, and pains, would have indicated, according to the common practice, blood-letting and other evacuations, in this case. The powers, however, by which a cure was effected, proved, that these symptoms depended upon a state of indirect debility; and that the use of debilitating powers, would have been improper. For the same rea-



son, it may be inferred, that a peculiar slowness, as well as a quickness of the pulse, sometimes takes place in a state of indirect debility. Every departure of the pulse from the healthy standard, whether in quickness or slowness, depends upon debility; as well as every deviation from health, in any of the other functions. Costiveness, as well as purging, depends upon debility of the intestinal canal. This is shewn from patients affected with the same disease having, in some cases a quickness, in others, a slowness of pulse; in some cases purging, in others costiveness; and all of them being cured by the same means. It is farther corroborated by the proof, that such a state as that of excessive excitement, cannot take place. As blood-letting is the abstraction of a high stimulant power, it must be shewn that diseases of excessive excitement exist, before it can be admitted as a remedy. Or if it be contended that blood-letting is useful in diseases of debility, it must be shewn that it acts as a stimulant power. Mere assertions that it has been found useful, do not amount to a sufficient refutation of this reasoning.

THERE was an error of some importance in the treatment of this case, which affords the most convincing proof of the necessity of repeating the doses of medicines, at certain regular intervals, and by a certain rule.---On the morning of the 25th,---after having taken four grains of



opium and ten grains of calomel, at nine and at twelve o'clock, the preceding night, the patient was seized with violent griping and spasms. This symptom, as I have had frequent opportunities of observing, was undoubtedly owing to the doses not having been repeated at proper intervals. If a dose of equal strength, or one somewhat smaller, had been given at three, and another still smaller, at six o'clock in the morning, the state of indirect debility, constituting spasm, would not have taken place. As these symptoms may be occasioned, or prevented, at pleasure, the fact is incontrovertible. In this case, they immediately yielded to the stimulant power of the warm bath,----another proof that they arose from a state of indirect debility, occasioned by a deficient frequency or force, in the application of stimulant powers. Opium, calomel, camphor, æther, or castor oil, given in just proportions, would have produced the same effect with the warm bath. But external applications may often, with great advantage and convenience, be alternated, or conjoined, with internal remedies.

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#### CASE IX.

ROBERT WILLIAMSON, aged 25, was admitted into the General Hospital, at Calcutta,



on the 28th of October, with a quick and small pulse, laborious breathing, pain of back, loins, &c. His face was turgid; and his eyes red and starting. His tongue was foul and furred. He reported that he was attacked with fever, seven or eight days before, which had become more severe and continued for the last two days. Some medicines had been taken before he came into the Hospital.---At 3 o'clock P. M. when I first saw him, ten grains of calomel were ordered to be taken every three hours. At 10 P. M. his pulse was 112, and his breathing exceedingly laborious. A scruple of calomel was ordered to be given immediately, and to be repeated at one o'clock, A. M. A blister was applied to his sternum. On the 29th of October, his pulse was 120, with burning heat of skin. His tongue felt like a rough board. He had one small stool in the morning. Ten grains of calomel were ordered to be repeated every three hours.---At 9 o'clock P. M. his pulse was 124. He had one stool\*; his breathing was laborious, his eyes

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\* In this case the medicine seemed to produce but a very small effect. If to supply the waste of the excitability be the proper function of the lungs, it is evident that, after a certain degree of organic lesion has taken place, it cannot be recruited. But stimuli are not therefore to be withheld. For, by such a treatment, the excitability must be still farther exhausted.



starting, and he seemed in all other respects worse. Three grains of opium and twelve grains of calomel were desired to be given immediately, and repeated at twelve o'clock. October the 30th, he died at 4 o'clock, A. M.

UPON dissection, the thoracic viscera were found adhering to each other, in such a manner as to form but one mass. The lungs adhered to the pleuræ, mediastinum, and diaphragm; the heart to the pericardium; and the pericardium to all the surrounding parts. The adhesions were remarkably strong as well as general. The lungs were of a darker blue than usual. Upon a general view of the abdominal viscera, they appeared to be found. The scrotum was gangrenous. In one of the arms, there was the mark of a recent incision, made by a lancet.

THIS was undoubtedly a case of the most violent peripneumony. According to the common practice, the patient would have been repeatedly bled. Would the abstraction of blood have produced a resolution of the adhesions, which were found in the thorax? The greatest partizan of the practice, I think, would scarcely affirm it. According to the confused notions entertained of peripneumony being a disease of excessive excitement, it becomes necessary, in order to preserve some appearance of consistency, to divide



the disease into different stages ; and to use a different or even an opposite plan of treatment, in each. Is it possible that any disease can vary in its progress, excepting in degree ? And if not, ought the powers applied for the cure to be varied, in the progress of any disease, excepting in their degree of force ? These would appear to be the conclusions of reason and common sense. But to overturn such flimsy arguments, come in medical hypotheses and say “ inflammation we *suppose* arises from an increased impetus of the blood in the part affected, “ and is *therefore* to be cured by diminishing “ the quantity of that blood. In peripneumony, there is an inflammation of the lungs ; and “ in order to cure the disease, the impetus of “ the blood in the lungs must be lessened by “ blood-letting.” To this curious fabric of “ reasoning, I will just oppose a single fact.— There is not an inflammation, with which we are acquainted, that is not to be cured (as far as it is curable) by the application of stimulant powers,—as warm fomentations, tincture of opium, tincture of cantharides, camphorated spirits, æther, volatile alkali, and mercury. If any person seriously doubts the fact, it will be an easy matter to submit it to the test of experiment.— And if there be any other reason, for persevering in the practice of blood-letting, than because it is derived from the hypotheses of the



schools, and is conformable to custom, let it be produced. That blood-letting had been used, in this case, previous to the patient's having been sent into the hospital, appears probable from the incision in the arm:—that he was purged is known. As catharticks, however, produce an increased degree of excitement, before the debilitating operation of purging succeeds, their stimulant effects will often more than counterbalance the indirectly debilitating effects, which afterwards arise. But as blood-letting is a directly debilitating operation,—the abstraction of an ordinary and powerful stimulus,—it must always be highly injurious. In diseases of direct debility, as far as they can become subjects of medical treatment, it must add to the accumulation; in those of indirect debility, it must increase the exhaustion (\*). It is upon the supposition alone that some diseases depend upon a state of excessive excitement, that blood-letting can ever be thought admissible. And that such a state does not exist has, in my opinion been fully proved. I know it will be urged, by individuals, that they have found blood-letting useful. But this, like many other medical facts, is mere assertion, not proof. Whatever has been useful in one case, must be useful in every similar case of disease. But it is not so with blood-letting.—It

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\* Vide, "View of the Science of Life," Prop. XXVI.



has not invariably been found useful in any one disease. We may therefore, I think, fairly conclude, that it has never been useful in any one case of disease. If it be said that this is reasoning, and that experience; let me be permitted to ask whether just reasoning and real experience can ever differ? It is impossible.—Whatever is true in theory, must be right in practice. To inculcate a contrary opinion is the grand shield of empiricism. Circumstances delivered as facts, from the presumed experience of individuals, ought never to weigh against principles, which are deduced from numerous and undoubted facts, and which can be put to the test of experiment by all mankind.

THE quantity of calomel given here was large. But after taking two scruples at two doses, and allowing time for the operation of purging from indirect debility to take place, only one scanty stool was produced. This shews clearly, that, although the quantity was large, in proportion to what is usually given, it was by no means sufficiently large in proportion to the exhaustion of excitability that had taken place; or, in other words, to the violence of the disease. Altho' it be extremely doubtful whether the excitability can ever be accumulated to the healthy standard, by any degree of stimulant power, when so many



principal organs have become unable to perform their functions ; yet it is certain that, in order to give a patient, in such circumstances, the only chance of cure, the stimuli should be increased in power, until they produce some effect. In this case, therefore, the medicines should have been both increased in quantity, and more frequently repeated. But as, in every kind of practice, the prejudices of patients, or carelessness of attendants, will frequently render it impossible strictly to adhere to the application of principles, we can only make such an approach to them, as these, and other circumstances, will permit.

HAD it not been my wish to bring the theory and practice of this doctrine to the fullest and fairest proof of discussion and experiment, this is one of those cases which I would have suppressed. It is to be regretted that writers do not oftener think it necessary to publish their unsuccessful, as well as their successful cases.

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### C A S E X.

ROBERT WOODSIDE, aged 25, was admitted into the General Hospital, at Calcutta, on the 24th of October, with a dysentery of a fortnights



standing. He had 10 or 12 stools in the day, with blood; and complained much of headach, pain of loins, griping, and tenesmus. He lay easiest on his right side. His pulse was 108: and he had frequently a flush in both cheeks. I began by giving him small doses of calomel, frequently repeated; frictions of mercurial ointment; and draughts of 70 or 80 drops of tincture of opium, repeated according to circumstances, through the night. In the course of a few days, the calomel was increased to six grains, with two grains of opium, every two hours; an ounce and a half of ointment was rubbed in at four times, in the course of the day; and draughts, with two hundred drops of tincture of opium \* in each, were given, every second hour, during the night. The calomel was occasionally alternated with camphor, and the tincture of opium with æther. Blisters were applied, and glysters of castor oil frequently given. These applications were made in concourse or succession; and increased or diminished in strength, according to the judgment formed of the state of the excitement, at the time. For a fortnight he seemed to get bet-

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\* Some cases of dysentery will require much more than this quantity. It is to be recollected however, that the laudanum was weaker, perhaps one third, than what is commonly used in Europe.



ter ; at one time, the purging rather decreased, and he had no blood in his stools. But from his mouth not being affected, so as to produce an increased flow of saliva, after having used an uncommon quantity of mercury ; from frequent sickness and vomiting ; his always lying on the right side ; some degree of fullness and anxiety ; an occasional flush of the cheeks ; and his having no appearance of getting better upon the whole ; I concluded, although there was no apparant enlargement, that his liver was diseased.\* The medicines, however, were continued, with a view of supporting the excitement, with as much equality as possible. He continued nearly in the same state as at first described, until the 14th of November, when his pulse (which had varied throughout from 64 to 108, with intermissions occasionally) increased in frequency to 120. His tongue became very dry and glossy. On the 15th, together with his other symptoms, he had a severe hiccup, and intermission of the pulse after every 7th or 8th beat. On the 16th the hiccup was severe and incessant ; his pulse 116, and intermittent ; he had no power in his extremities—and at ten o'clock P. M. he died.

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\* By disease of the liver is meant, that state in which it is incapable of performing its functions, whether it consist in inflammation, suppuration, induration, enlargement, &c.



IN tedious illness, patients naturally get disgusted with their medicines in the course of some weeks, or their attendants become negligent. Although both these circumstances happened, in some degree, in this case, the directions were upon the whole observed with much punctuality. From the beginning a cure was not expected. For in every similar case, of between twenty and thirty that were opened by myself, and some by Dr. Yates, the appearances of local disease were so much alike, that I can now almost venture to pronounce, from the symptoms, in what state the viscera will be found, upon dissection. In this case, I was so certain the liver was diseased, that it was mentioned in the daily report some time before his death. Upon dissection, there were found several abscesses in both lobes of the liver, communicating with each other, and containing, in all, about one pound of matter, of a thick consistence and white colour. On the upper surface, there were five or six ulcers, communicating with the abscesses. The edge of the right lobe, a part of the colon in contact with it, and part of the diaphragm, at its origin from the cartilages of the ninth and tenth ribs, were all sphacelated. The intestines, omentum, &c. were adhering throughout.

ARE flushed cheeks a symptom common to persons, whose viscera are diseased, whether of



the thorax or abdomen? I have frequently observed it in both.

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### CASE XI.

THOMAS KELLAN, aged 28, was admitted into the General Hospital, at Calcutta, on the 2d of October, 1796, with dysentery of five weeks standing, accompanied by pain in the region of the liver. He had the usual symptoms of griping, tenesmus, and a discharge of blood; generally lay either upon his right side, or in a sitting position; in the latter of which he found most ease. He was frequently sick, and vomited. His tongue was white and furred; and his pulse 104. Four grains of calomel, and one grain of opium were given every hour. One ounce of mercurial ointment, and half an ounce of calomel were rubbed in. On the 4th, he was easier, and had slept well. His tongue and pulse remained as before. The ointment was ordered to be rubbed in, morning and evening, and the pills to be continued\*; he was allowed eight glasses of

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\* In the commencement of this case, two mistakes were made: one in not giving draughts at night, and the other in not rubbing the ointment at shorter intervals.



wine in the twenty four hours\*.—Eight o'clock P. M. he had slept much during the day; pulse 120; he was in other respects much as before.---5th, his pulse was 120, and he complained of weakness. He had six or seven stools, without blood; and was much inclined to dose. He complained of considerable pain, and burning sensations, in the region of the liver. A blister was ordered to be applied; and two grains of opium, with eight grains of calomel, to be given every hour. He was allowed twenty glasses of wine in the twenty four hours.---6th, he had taken ten doses of the opium and calomel. Was much vomited and purged, and had some degree of fever during the night†; but was then better. Pulse 108. The pain in the region of the liver was somewhat relieved. A pill of one grain of opium and four of calomel was ordered to be taken every hour; a draught with one hundred and fifty drops of tincture of opium, to be given at eight o'clock P. M.; and to be repeated at twelve. The ointment was continued.---7th, he slept well, and had only two stools. Had taken seven pills, and the draughts; pulse 100.

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\* This quantity was by far too little. In a case like this, a wine glassful every hour, would not have been too much.

† In consequence of the irregular exhibition of the pills. This frequently happens, when pills are given in the day, and discontinued at night; or where draughts are not given at night, in lieu of them.



The pills, ointment, and draughts, were continued.---8th, he was considerably better ; had five or six stools. He had taken eleven pills, and the draughts. The pills, ointment, and the draughts reduced to 100 drops, were continued. ---9th, he had taken ten pills, and one draught ; had some stools yesterday, but none last night. Pulse 100 : no sickness. The medicines were continued.---10th, having begun to get indifferent about taking his medicines, they were varied, in order to humour him. Instead of the pills, a mixture consisting of half an ounce of tincture of opium, and one pint of water, was given, in divided portions, in the day. This was again alternated with pills. Blisters were repeatedly applied, and the draughts were continued ; but the pain and burning sensations over all his abdomen sickness and vomiting ; frequency of stools with blood ; smallness of the pulse, &c. seemed to be rather increasing. On the 14th, the tincture of opium in the mixture was increased to an ounce and a half, to one pound of water, of which he was ordered to take an ounce every half hour ; the ointment was omitted, and the draughts continued. On the 15th, he said that he had been easier the day before ; but, having become irregular in taking his draughts, he was frequently purged and griped at night. From that period till the 23d, the opium and calomel, from two to four grains of the one, and



from six to ten grains of the other, were alternated with the mixture ; the ointment was rubbed occasionally ; and the draughts, with from 60 to 100 drops of tincture of opium were given at night, or 3 or 4 grains of opium, whichever he seemed inclined to prefer. From the 23d of October, to the 18th of November, he appeared to be so much better, that, although confident of the existence of much internal local disease, I was not without hopes, that it was of such a degree as to admit of a reproduction of parts. His pulse varied from 80 to 96. The doses of medicines were considerably diminished. Camphor, four grains every two hours, was alternated occasionally with the calomel and opium. Glysters, with one ounce of castor oil, were sometimes given every hour, or every two hours ; and two pounds of decoction of bark, with an ounce of powder, was given in the day. The ointment, and calomel pills were gradually diminished, to two drachms of the former, four times in the day ; and two grains of the latter, every two hours. His sickness and vomiting still recurred. The burning sensations of the abdomen continued. And he was sensible of a feverish exacerbation every third day.—Nov. the 17th, the pills were omitted, and the other medicines continued.—18th, he had not taken any of his medicines the day before. Complain-



ed of the offensive smell of his breath. This was evidently occasioned by leaving off the medicines. Being tired of all those to which he had been accustomed, I thought it might be of use to try the effects of *hepar sulphuris*, to remove the offensive smell of his breath, and prescribed one drachm three times a day. The other medicines (*viz.* decoction of bark, glysters, and draughts) were at the same time, desired to be continued.—20th, he had frequent sickness, and vomiting; much purging, and great thirst. No appetite; and a sense of burning heat in his stomach and intestines. Common flowers of sulphur had been given, instead of the *hepar sulphuris*. They were desired to be omitted. Two pounds of decoction of bark, with half an ounce of æther, was given, in the course of the day; and the draughts were repeated.—22d, his symptoms continued as before. There was an evident enlargement of the right lobe of the liver; but no perceptible undulation. From that period, he had two pounds of decoction of bark, with two hundred drops of tincture of opium, in the day; the draughts occasionally at night; calomel, castor oil, and other medicines were also given, and alternated, so as to prevent, as much as possible, his being disgusted with a sameness of treatment. But the symptoms were rather increasing in violence. The purging became



more severe, with blood in his stools; sickness and vomiting more frequent; he complained much of heart-burn; and had sometimes feverish paroxysms, which seemed to be of a quartan type. There was, from the beginning, a flush in both cheeks, like those of a consumptive person. He complained of insensibility of the back, and weakness of the extremities. From all these circumstances, and from no increased flow of saliva having been produced by the mercury, I concluded that there was such a degree of local disease, as to render the case incurable, by any treatment that was possible, in such a situation, to be pursued. It was, however, persisted in, with as much regularity as was practicable. He continued gradually sinking, until the 2d of December, when he died.

UPON dissection, the left lung was found adhering strongly to all the neighbouring parts. Its substance was unusually dry, hard, and yellow; and appeared as if it had not, for some time, transmitted blood, or performed its proper functions. The liver weighed about five pounds\*, was considerably indurated, but had undergone no suppuration. The other abdominal viscera were adhering, in such a manner as to form but one mass; with the exception of the spleen, which

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\* The average weight of a sound liver, I believe, may be about three pounds and an half, or perhaps somewhat more.



had a sound appearance.—The cœcum, colon, and rectum, were ulcerated throughout their whole extent. The ulcers were, in many places, an inch in diameter ; and had penetrated the two inner coats. It is somewhat remarkable that, in between thirty and forty cases of dysentery which I have seen opened, there was not, in a single instance, any of the scybala mentioned by authors, as a symptom of that disease.

THE uncommon quantity of mercury that was here used, without being followed by any affection of the mouth, was a sufficient proof that there existed a lesion of organs, which, if curable, required the application of still higher powers than those that were employed. Even in external local affections, it is now well known, that a cure depends more upon the support of the general excitement, than upon local applications. The cure then, of internal local disease, were it even possible to apply local remedies, must still be performed by the application of powers, calculated to support the general excitement.

WE have yet, perhaps, no adequate idea of the degree of power, that may sometimes be required, to produce this effect. But it is very certain that, while in some cases by far too little, in others by far too much of stimulant power is applied. Mercury, for instance, in cases of dysentery, is generally used in too small proporti-



ons, while in venereal cases, it is by much too freely given. Half a grain of calomel, or less, given every two or three hours, will in a short time effect a cure in ordinary cases of chancre, gonorrhœa, or even a certain degree of syphilis. In these cases, there is seldom any great degree of organic lesion, at least of those organs which are most essential to life. It is only when some of the primary organs are in a state of local disease, that a great and long continued application, of high stimulant powers, becomes necessary, in order to re-produce health. Of this, dysentery is one of the most familiar and fatal examples.

The diminution of the medicines that was made at one period, upon the prospect of the patient being better, was injudicious. Although, in such a case, no plan would probably have succeeded, a perseverance in the regular application of high exciting powers, would have given him one chance of recovery.

THE offensive state of his breath, of which he complained on the 18th of November, was evidently occasioned by the subduction of the medicines. This is a symptom of indirect debility, as well as salivation, purging, sweat, or any other effect of an irregular application, or sudden subduction, of mercury. That these effects are so frequently produced, by the ordinary mode of ex-



hibiting that medicine, ought not to surprise us. It is also obvious that if, when given at random, this and other medicines of high stimulant power so frequently produce good effects, their salutary effects, when applied according to just principles, may be expected to surpass any thing, of which we can yet form an idea.

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## CASE XII.

JOHN CLUFF, aged 30, was admitted into the General Hospital, at Calcutta, on the 18th of November, 1796, with a dysentery of some days standing. He had incessant calls to stool, passed blood, with severe griping, tenesmus, and prolapsus ani. His thirst was intense; and he seemed in dreadful agony, from lancinating pains. Six grains of opium, and eight grains of calomel, were ordered to be given every hour; a glyster, with three ounces of castor oil, and three ounces of warm water every hour; and half an ounce of mercurial ointment to be rubbed in, four times in the day. A bottle of Madeira, in two quarts of barley water, was prescribed for drink. At twelve o'clock, A. M. he had taken two of the pills, and seemed easier.



In consequence of a consultation, the pills were ordered to be omitted, and two ounces of the following mixture to be given every half hour ;—viz. Sal. Cathart. Amar. ten drachms, Crem. Tart. two drachms, Tart. Emetic two grains, water one pint. A draught, with one hundred drops of tincture of opium, was ordered at eight o'clock, and another at twelve. November the 19th, after having taken the mixture, he was both vomited and purged. These operations continued occasionally during the night, and were not entirely stopped by the draughts. His pulse was 92, tongue foul, and thirst intense ; he complained of great pain across the umbilical region ; and passed blood in his stools. The mixture was ordered to be repeated ; the ointment and glysters to be continued ; warm fomentations to be used ; and three draughts, with one hundred and fifty drops of tincture of opium in each, were ordered to be given at night, at intervals of three hours. November the 20th, he was much better. His tongue, however, was foul. The glysters did not seem to produce much effect. The mixture, ointment and draughts were ordered to be repeated ; and the glysters to be discontinued.—21st, having, on the evening of the 19th, taken his three draughts at once, in the course of yesterday, he became rather confused ; and was dissuaded, by one of his comrades, from tak-



ing the draughts the night before as prescribed. He appeared much confused; but the purging was less severe. The mixture, ointment, and draughts, with one hundred drops in each, were desired to be repeated. 22d, he was again dissuaded, with the best intentions however, from taking his draughts; in consequence of which his confusion increased, and he ran about the ward, in a state of considerable derangement, all night. I represented to his friend, who had withheld the medicines through kindness, the danger of persevering in such conduct; and entreated that he would exhibit the doses exactly as they were prescribed, which he afterwards punctually did. But in order to ensure a compliance, I thought it best occasionally to vary the remedies, and to use such as should fall in with the prejudices of the patient and his friend. Accordingly one drachm of jallap was immediately given. The warm bath was desired to be used three times a day; and after the bath, two drachms of mercurial ointment to be rubbed in each time.—When the operation of purging should commence, after the exhibition of the jallap, a pill, consisting of four grains of opium, and six of calomel, was directed to be given every hour; and to be continued through the night, in lieu of the draughts.---23d, in the course of



the preceding day and night, he had taken nine pills, consisting of four grains of opium and six of calomel each. He slept well ; had little purging ; and was free from pain. He only complained of weakness and thirst. The pills were reduced to two grains of opium, and four grains of calomel, every two hours. The ointment was continued ; and the bath and glysters omitted.---24th, he was better. He still passed some blood by stool, and had a difficulty in making water. He complained that his mouth was sore. These symptoms I judged to have arisen, either from the subduction of stimulus the day before having been too great, or the patient having neglected to take the quantity that was prescribed. The medicines were desired to be continued ; and the patient was particularly enjoined to take them regularly.—25th, his mouth was less sore, he had fewer stools, and no blood in them ; his skin was moist and his pulse 80.—26th, pulse 88, and smaller. Purging and griping continued. By mistake, he had no pills during the night. This fully accounted for the alteration since the day before. He was ordered to have a quart of decoction of bark, with two hundred drops of tincture of opium, to be taken in divided doses through the day. Two drachms of mercurial ointment, and one drachm of calomel, were rub-



bed in four times in the day\*. On the 27th, he was rather better; the medicines were continued; on the 28th, he was much the same; the decoction, with two hundred drops of tincture of opium, was continued.—He did not always take the whole of the decoction; but generally more than two thirds of it. The ointment was diminished to one drachm four times in the day; and two draughts, with eighty drops of tincture of opium in each, were ordered to be given in the night.—29th, he had taken the draughts and slept well; had only one stool; pulse 84;—tongue clean; he felt some degree of oppression about the pit of the stomach; a blister was applied; the ointment was omitted; the decoction of bark, with tincture of opium, was ordered to be continued; and the draughts to be reduced to sixty drops. From that period, he continued to get better. The stimuli were increased, or diminished, according to circumstances; and on the 12th of December, he was discharged without any complaint, excepting a little griping at times. At his own request, he had a small phial of tincture of opium, and some pills, with directions how to take them, if

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\* On the 26th and 27th there was an omission, in not prescribing draughts or pills, sufficient to support the excitement in the night.



required, before he could join his ship at Diamond Harbour.

WHEN, in consequence of consultations, as happened in this case, cathartics were exhibited, I endeavoured so to manage them, as regularly to support the excitement; and to prevent, as far as possible, the state of indirect debility, which constitutes vomiting and purging, by exhibiting other stimuli, on the commencement of these operations. But this is generally very difficult to accomplish, principally from the ideas, which patients traditionally imbibe, of the utility of these operations.

ACCORDING to the hitherto uncertain state of the art, it is not surprizing that consultations, in which, to use the words of an elegant writer, "learned physicians neutralize their plans,\*" should seldom be productive of benefit to patients. They are too often scenes of mutual complaisance, in which he, who has most to gain, sacrifices most of his opinion. This has been a subject of much regret to sensible men of the profession; and such scenes have consequently been avoided by many of them. It is no mean proof of the truth of the medical principles, asserted in these pages, that

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\* Aikin's Letters to his Son.



two persons, who thoroughly understand them, will differ, but in a very small degree, in their application to practice. In this respect, I have known a coincidence so perfect, that it could, in no other manner, be accounted for. Their general adoption, then, would banish that vulgar adage, which, at present, not undeservedly attaches a degree of ridicule to the cultivators of the healing art, "doctors differ."

IN the report of the 24th of November, it is observed, that the patient had a difficulty in making water, and a soreness of the mouth, which were judged to have arisen, either from the subduction of stimulus, on the 23d, having been too great, or his having neglected to use the quantity prescribed. This is not hypothesis; but a clear induction of facts. It is certain, that a difficulty of making water, is a symptom that arises from a state of indirect debility, whether that succeeds the exhibition of cantharides, opium, or any other stimulant power. It is also true, that it may be cured by opium, the warm bath, or cantharides. The general mode of applying blisters is such, as often to induce that state; and is therefore improper. Blisters of a small size, frequently repeated, will produce a regular excitement, like successive frictions of mercurial ointment. But they ought not to lay on the skin ten or twelve hours;



nor so long as to be succeeded by vesication, which is a state of indirect debility. Neither is it necessary that they should be applied, in preference, to any particular spot. For, although they make the first, and a somewhat greater impression, upon the part, with which they come immediately in contact; yet, to whatever part of the body they are applied, their action will extend to every other. The action of stimuli upon the excitability, may be compared to an electric shock, which, seemingly at the same instant of time, affects every person in company,—the nearest and the most distant from the phial. When the *modus operandi* of the one is ascertained, we may expect to ascertain the *modus operandi* of the other.

IN the preceding, as well as in many other cases, medicines were often exhibited improperly; sometimes from omissions in prescribing, sometimes from negligence or mistakes of attendants, and sometimes from the prejudices of the patient.

WITH any number of patients, there cannot be much difficulty in prescribing, according to the old plan of practice, which consists in giving certain fixed doses of medicines, in every disease, whatever be its degree. But justly to proportion the application of stimulant powers, to the exhaustion of the excitability of each patient, requires more exertion of judgment and consideration, on the part of the practitioner, and a stricter conformity with directions, on the part of the



patient, and of the attendants. It is evident then that, in an hospital, it requires an unusual degree of exertion to apply these principles to practice, in from thirty to forty bad cases of disease, daily. But it is their introduction only that is difficult. Once generally admitted, their application would be attended with as much facility, and certainly with more pleasure, because with more success, than any routine of empiricism.

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### C A S E XIII.

ISAAC HUDSON, aged 30, was admitted into the General Hospital, at Calcutta, on the 31st of October, 1796, with the following symptoms: Pulse 132, and small. He had for some time feverish paroxysms, at 11 o'clock, A. M. and 11 P. M. which continued between two and three hours. Tongue foul; skin hot; his bowels were quite irregular, sometimes extremely loose, at other times excessively costive. He had a cough, with hoarseness; and pains of the bones and joints. Together with these complaints, he had chancres of a fortnight's standing.—One grain of opium and one grain of calomel were prescribed every hour; and two drachms of mercurial ointment were ordered to



he rubbed in, three times in the day. November the 1st, pulse 96. The fever and purging continued. His pains were rather less severe. His tongue was very white. Ten grains of calomel were given every three hours. On the 2d, his pulse was 92. He had taken four doses of the calomel. His tongue was less foul. Eight grains of calomel were ordered every three hours, day and night.—3d, pulse 88; he had taken eight doses of the calomel. He had a sore throat and hoarseness, with an incipient spitting. The calomel was omitted, because it was deemed highly probable that he would not have taken it, if prescribed. Three grains of opium were given every hour. And three drachms of ointment were ordered to be rubbed in, three or four times in the day.—4th, his mouth and throat were very sore, and he spit some blood; from whence it was concluded, that he had omitted to take his medicines, or that he had used them in an irregular manner. A blister was applied to one of his cheeks; two grains of opium were given every two hours; and a glyster, with one ounce of castor oil, was ordered every two hours. He was allowed four glasses of wine in the day. On the 5th, his mouth became very sore, and there was some increased flow of saliva. A blister was applied to the other cheek; the pills and glysters were continued; and he was allowed six



glasses of wine.—6th, his mouth became exceedingly sore, and his face more swelled. He had no stool ; a blister\* was applied to his breast. The pills were ordered to be continued, and a glyster, with two ounces of castor oil, to be given every second hour.—7th, he was much in the same state ; the medicines were ordered to be continued. On the 8th, he had some difficulty of breathing, his pulse was exceedingly small, and he had fainting fits. Upon enquiry, it was found that he had lately neglected to take the medicines, which he himself confessed. In order to ensure compliance in this respect, a change was made in the medicines. He was put into the warm bath three times in the day. The glysters were continued. And he had three draughts, with one hundred drops of tincture of opium in each, at regular intervals in the night. 9th, he was better ; his pulse was 108 and stronger. Cough less severe ; and swelling of the face abated. The bath, and glysters were ordered to be repeated ; and a draught, with forty drops of tincture of opium, to be given every hour.—10th, he was much in the same state ; the medicines were con-

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\* Among patients, upon whose veracity there is not much dependence, I prefer in these cases, the use of blisters, upon this principle, that they cannot deceive.



tinued.—11th, his breath was very foetid, and tongue much swelled; which evinced that he had been irregular in taking his medicines. A blister was applied to his neck, and the other medicines were continued.—12th, he was rather better; the medicines were continued; and two drachms of ointment were ordered to be rubbed in, twice a day.\* —14th, his mouth continued very sore, and he complained of weakness; one drachm of ointment was rubbed in three times in the day, and the other medicines continued.—15th, he seemed better, but complained of weakness; some blood was discharged from his mouth and fauces; he did not permit the ointment to be rubbed in, the day before. The ointment and glysters were continued; and he was enjoined to use his medicines regularly. The following mixture was given,---decoction of bark two pounds, powder of bark one ounce, tincture of opium one hundred and fifty drops; the whole of it was ordered to be taken, in divided portions, in the day. The draughts were continued as before. From that period, he got gradually better. His mouth became more or less sore, in the exact proportion of the regularity, with which he took his me-

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\* This was too seldom. Wherever mercurial frictions are necessary, they ought to be used at least four times in the day: and it would also be attended with advantage to repeat them at night,



dicines. By that symptom, I could detect his irregularities. He continued, for some time, subject to purging, and slight paroxysms of fever occasionally. But, by a perseverance in the same plan of treatment, diminution of the medicines, he remained, on the 13th of December, free from complaint, excepting a slight soreness of the mouth. And on the 14th, when I discontinued attending him, he was in an advanced state of convalescence.

THIS is one of those cases, which shew that soreness of the mouth, and salivation, do not arise from the action of mercury, when regularly applied, and gradually decreased; but that these, and other symptoms of indirect debility, arise in consequence of its irregular application, or sudden subduction. This patient, like many others, was so sensible of the truth of the above observation that, after there was a necessity for using the warm bath, he took his medicines with much regularity, until he became convalescent. He was, from repeated experience, convinced that the soreness of his mouth increased, upon the subduction of the mercury, opium, or warm bath.

FROM the beginning, I was doubtful of a recovery. For, a small and quick pulse, hoarseness and difficulty of breathing, and the very irregular state of his bowels, indicated that some degree of local



affection, both of the thoracic and abdominal viscera, had taken place. From the issue, however, it appeared that they were of such a degree, as to admit of a regeneration of organs.

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#### C A S E   XIV.

ABRAHAM JACKSON, aged 23, was admitted into the General Hospital, at Calcutta, on the 15th of November, 1796, with dysentery of a few days standing.—16th, he had four doses, consisting of ten grains of calomel each, through the night. Pulse 100; tongue white; skin hot. There was a considerable quantity of blood in his stools. Ten grains of calomel and four grains of opium, were ordered to be given every three hours; and a glyster, with two ounces of castor oil, every two hours. On the 17th, he was rather easier; but had been much griped through the night.\* The glysters gave him ease. The pills were intended to have been continued through the night; but as it was not particularly expressed in the report, they were not given.—The pills were omitted; a glyster was given every hour; and common infu-

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\* Griping, purging, and restlessness, are frequently produced under a course of opium, or mercury, in consequence of the doses not being properly repeated through the night.



sion of senna, with two grains of tartar emetic, in small doses, frequently repeated through the day. Draughts, with eighty drops of tincture of opium, were desired to be given at bed time; and to be repeated, according to circumstances, through the night.—18th, he was rather better. One grain of opium and four grains of calomel were given every second hour. Two drachms of mercurial ointment were ordered to be rubbed in, four times in the day. The glysters and draughts were continued.—19th, he had taken only one draught; and his head became confused towards morning\*. He was much griped. Pulse 80. The draughts were omitted, from a conviction that he would not take them. The other medicines were continued; and warm fomentations applied to the abdomen.—20th, he had not slept well, and was much purged and griped. The pills were omitted; and a solution with ten drachms of *sal catharticus amarus*, and two grains of tartar emetic, was given, in small doses, through the day.—21st, from this period, he had a quart of decoction of bark, with one hundred drops of tincture of opium, daily; one drachm of mercurial ointment was rubbed in,

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\* It cannot be too often insisted on, that this symptom arises from medicines not being properly repeated. It is what frequently happens, in the ordinary way of exhibiting opium; and for which the medicine itself is by no means to blame.



four times in the day ; and three draughts, with sixty drops of tincture of opium in each, were given at intervals during the night. He continued to get better. On the 28th, he was so well, as to ask leave to go to town.—29th, having committed excesses the day before, he had pains and other feverish symptoms. His pulse was above 100. He was ordered to have a mixture of *sal catharticus amarus* ; and the draughts were repeated. 30th, he had a severe paroxysm of fever in the night, and perspired profusely. Pulse 100. Two grains of opium and six grains of calomel, were given every second hour. Two drachms of mercurial ointment were directed to be rubbed in, every three hours\*. December the 1st, he perspired profusely, and had a paroxysm of fever in the night. Pulse 100. Three drachms of ointment, with one drachm of calomel, were ordered to be rubbed in, four times in the day. The pills were continued. And three draughts, with 60 drops of tincture of opium in each, were ordered to be given, in the course of the night.—2d, he was worse. His pulse was 112 ; he had a paroxysm of fever, and some purging in the night. The ointment was continued. A pill, with four grains of opium and eight grains of calomel, was given

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\* It was a great omission, at this time, not to have given draughts, or pills, through the night.



every second hour in the day ; and three draughts, with eighty drops of tincture of opium in each, in the night. On the 3d, he was better. Pulse only 100. On the 4th, his pulse was 96, and his mouth a little sore. 4th, 5th, and 6th, his medicines were continued ; he was better ; and had no fever. On the 7th, having discontinued his medicines the day before, his mouth became very sore, and an increased flow of saliva commenced. The pills were ordered to be reduced to six grains of calomel, and three grains of opium ; the draughts to be repeated ; and the ointment to be omitted. But as I had no reliance on his taking the pills regularly, a quart of decoction of bark, with a hundred drops of tincture of opium, was ordered to be taken in the day, to prevent his mouth from becoming excessively sore.—8th, did not take the pills on account, as he said, of his having some difficulty in swallowing them ; but took the decoction and draughts ; pulse 100 ; his mouth continued sore, and the flow of saliva increased. Three drachms of mercurial ointment were ordered to be rubbed in, four times in the day ; and he was informed that, if he did not allow it to be regularly applied, his mouth would become much sorer. The decoction and draughts were continued ; and the pills omitted.—9th, he spit freely ; and seemed much better. The decoction and draughts were continued ; and the ointment omitted. From that period, he was convalescent. And on the 14th of



December, when I discontinued attending him, he had no complaint, excepting the soreness of his mouth ; which, however, was rapidly decreasing.

WHEN the medicines were increased to a due degree, as on the 3d of December, the patient speedily got better ; and had he continued to take them with regularity throughout, he would have got well much sooner. He had however taken a sufficient quantity, to be succeeded by an increased flow of saliva. And after that symptom occurred, he was considered as out of danger.

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IN the foregoing cases, in general, the state of the pulse has been noted with some care. The pulse in all its degrees of quickness, slowness, weakness, irregularity, and intermission, may be considered as a kind of thermometer, by which, together with the state of other functions, some judgment may be formed of the state of the excitement. A deviation from health in the state of the pulse, is one of the most constant symptoms of indirect debility. But the surest criterion yet known, by which to estimate the degree of exhaustion, is the effect produced, by the stimulant powers, applied for the cure.

WHEN the effects of the mercurial ointment were not deemed sufficiently powerful, calomel



was added. The ointment used was the strongest ; but the quick-silver was not always sufficiently triturated. It is almost unnecessary to observe that, in dangerous cases, mercury may at the same time be used, both internally and externally, with advantage.

THE explanations annexed to the cases will, perhaps, appear unnecessarily copious ; and, in some parts mere repetitions. But that was deemed the most familiar, and therefore, in some respects, the best mode of illustrating the subject. Examples will often place inferences in a clear point of view, when they might not be obvious from general reasoning.



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## POSTSCRIPT.

*By C. MACLEAN.*

**T**HE preceding cases, it will be observed, are not particularly selected from such as terminated happily. Those only that were deemed most instructive, in illustrating particular points, have been chosen. Many more of equal importance might have been added; but the publication would thus have become too voluminous. None of them are offered, as approaching to perfect examples; but merely as conveying a general idea of the mode, in which, according to our opinion, the principles of the doctrine should be applied to practice.

ALTHOUGH opium and mercury are the medicines, upon which we have placed most dependence, in diseases of high degree, as being more intimately acquainted with their powers; it is conceived that the doctrine, properly understood, embraces the whole range of the *Materia Medica*. It does not admit, indeed, of any other effect being produced, by the application of any power in nature, to living bodies, than an increase or



diminution of the vigor, with which they perform their proper functions; i. e. an increase or diminution of their excitement. With a view to the excitement solely is every medicine whatever prescribed. And when the means employed are unsuccessful, the failure should be attributed to a want of judgment in their application, rather than to any error in the principles themselves.

It ought not to be overlooked that, in most of the foregoing examples, the diseases were those of the greatest exhaustion, occurring among a set of men (soldiers, mariners, &c.) possessing robust constitutions, and accustomed to the application of high degrees of stimulant power. In diseases of warm climates, in general, the exhaustion is much greater than in those of cold climates. Perhaps too, in the former, the medicines lose much of their strength, before they come into use. So that a material difference will be required in the practice. Another caution that deserves to be attended to, in all countries, is to guard against the application of cold, during the operation of high exciting powers. For, when the smallest degree of indirect debility happens to take place, from irregularity in the application of these powers, the application of cold, or, to speak more correctly, the subduction of



heat, will increase the exhaustion, and add to the force of the disease.

THE strenuous and authoritative manner, in which this doctrine has always been opposed, renders a knowledge of its application to practice difficult to be obtained, even by those who thoroughly understand its principles. The laws of mechanics may be perfectly well understood. But if a body of artificers, who had from time immemorial conducted the operative part, in total ignorance of those laws, were unanimously to declare, "that the principals might indeed be both ingenious and just, for aught they knew, but that they were dangerous in their application to practice," it is certain that the public would for a time, be deceived by the representations of these workmen; and the principles of mechanics, however just or applicable, could not generally be reduced to practice, until the deception ceased. Moral truths may be perfectly well understood by a few; but the ignorance, prejudices, and passions of a great majority of the human race, will long retard their complete application to practice. Medical truths however have only to combat the prejudices and interests of a particular, and but a small body of men. It may therefore be permitted to hope, that their application to practice, cannot be much longer delayed.



THOSE who have admired, and those who have opposed the new medical principles, without being masters of the subject, must have been equally unsuccessful, in their attempts to apply them to practice. By every succeeding case of failure, the admiration of the one would be diminished, the opposition of the other confirmed. The objection, therefore, is very just, that “attempts to apply the principles of the “Brunonian Doctrine to practice, may be dangerous, in ignorant hands.” In other words, men cannot apply to practice principles, which they do not understand.—Let us suppose a person, wholly unacquainted with the *laws* of living bodies, applying *powers* to them; how can he be expected to produce a *given effect*? Overlooking the immense variety of degrees, between the state of health, and the highest state of exhaustion, he would probably prescribe one grain of a solid medicine, when he should have prescribed twenty; or twenty, when he should have prescribed but one; he would give twenty drops of a fluid, when he should have given two hundred; or two hundred, when he should have given but twenty. He would repeat the medicine but once or twice in the twenty-four hours, instead of every hour, or every half hour, according to the duration of its action. He would use the strongest powers, instead of the weakest; and



the weakest instead of the strongest. He would not make any distinction between the delicate female, and the robust male frame ; between childhood and youth, and youth and old age ; between recent and long standing diseases. He would not even know how to make allowances for inveterate habits. In such hands, no success could be expected, any more than from a mechanic, who should employ equal powers to raise unequal weights. He might sometimes indeed be right by chance.

FAR otherwise is it with him who applies principles to practice. He calculates, combines, and proportions his powers, according to known laws ; and applies them, in such a manner, as to produce certain and given effects. Nor is the practice of medicine different, in this respect, from any other art, which is founded upon principle, and requires a certain degree of mental exertion.

IN the preceding pages, some things may appear doubtful, the arrangement occasionally inaccurate, and the whole requiring illustration. Was it not even too late, I should not think myself at liberty, without the approbation of my ingenious and esteemed friend, Dr. Yates, to make any material alterations in the text. But, in the mean time, it may not be improper to offer such remarks, as have been dictated by subsequent re-



flection, and may perhaps lead to an arrangement somewhat different, if ever an opportunity should occur of revising the subject.

IN the first place, diseases of accumulation, or of direct debility, appear to be even more rare than we have supposed them. For if, to a body in a state of accumulation, the ordinary stimuli be applied, a disease of exhaustion will immediately ensue. But a body can never long remain in a state of accumulation, without having the ordinary degree of stimulant power applied, and sometimes even more. The accumulation, which is produced by the abstraction of heat, food, or the mental passions, if it be not immediately removed, by the gradual re-application of these powers, will be converted into a state of exhaustion, as soon as the ordinary exciting powers, which support the healthy state, are again applied. It is evident, then, that accumulation of the excitability, from the abstraction, or diminution of one or more stimuli, must soon terminate in the re-establishment of health, by the gradual re-application of these powers, or in the establishment, of a state of exhaustion, or of indirect debility, by their sudden and excessive re-application. But it is difficult to suppose, such a complete abstraction of heat, food or mental stimuli, as to occasion death, without the intervention of



some stimulant power, converting the state of accumulation into a state of indirect debility. When food and drink have been long withheld, even a draught of water will exhaust the excitability, and occasion death. Let us suppose a person travelling through a sandy desert, under the scorching rays of a vertical sun. If he was previously in a state of accumulation, from the abstraction of the ordinary stimuli, that would immediately be converted into a state of exhaustion\*. And a continuance of the abstraction, would still farther add to the exhaustion, until it terminated in death. When heat has been long abstracted, and to a considerable degree, a degree less than that which constitutes the common temperature, suddenly applied, will produce mortification, or the death of a part. The case of the Roman mother, so aptly quoted by Brown, will exemplify the same principle, as applied to the mental stimuli. The state of torpor in which some animals remain, during the winter, and the manner of their resuscitation in the spring, even in a lower degree of temperature than that in which they became torpid, at the same time that it affords a beautiful explication of the principles of this doctrine,

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\* This follows as a consequence from Prop. V. I. although not so stated in the text.



seems to shew, that death does not take place, from the mere abstraction of heat, or from accumulation of the excitability. In this state of prolonged sleep, while respiration is languidly performed, the other functions are diminished or entirely suspended. Thus in a two-fold manner, the excitability is accumulated, the susceptibility of impression is proportionally increased, and a degree of heat lower than that under which torpor took place in autumn, will produce healthy excitement in spring\*. It seems very difficult to conceive, how death can ever take place from mere accumulation. For while excitability remains, a due application of exciting powers will produce healthy excitement ; and when it is accumulated in an unusual degree, it is only required that a diminution of exciting powers, proportionate to the accumulation, or to the susceptibility of impression, should be made, in order to produce the highest excitement. But in every case, in which death *seems* to take place from accumulation, it is easy to conceive, that it *really* happens from exhaustion. For, in the highest degrees of accumulation, for instance, when a living body is nearly frozen, the smallest degree of exciting power, although greatly below the force

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\* This idea is, in part, taken from Dr. Girtanner.



of the ordinary stimuli applied in a state of health, will be disproportionate to the susceptibility of impression, and will therefore produce a state of exhaustion. And the farther subduction of heat, will increase the exhaustion so produced, until it terminates in death. Upon the whole, it may, I think, be concluded, that death never takes place directly from accumulation ; but always from exhaustion of the excitability. The state of accumulation, then, when it does not terminate in health by the gradual re-application of exciting powers, must always terminate in a state of exhaustion, by the application of exciting powers, disproportionate to the state of the excitability. Scurvy therefore, and the other diseases which have been mentioned as arising from the abstraction of stimuli, would seem to be all diseases of exhaustion or of indirect debility. In proof of this, every case, that I have met with at sea, resembling what has been described by authors under the name of scurvy, yielded to mercury. It was so certain a cure, that I never thought of using any other remedy. Nor did it at all, when properly exhibited, increase the debility of the patient. The reason why mercury has so often been found injurious in scurvy, is, that it has seldom been given in a proper manner. The salivation, of which authors complain, as being so easily excited, would never occur, if it was exhibited in such a manner,



as regularly to support the excitement. It is now perfectly known, that this and every other symptom of indirect debility, which succeed the use of mercury, arise from the subduction, not from the immediate action of that medicine. But where salivation actually takes place, after the application of mercury, or other stimulant powers, many facts concur in shewing, that but a small degree of organic lesion exists; and if a patient, in that state, ever dies, it must be from subsequent mismanagement. The complaints, therefore, against mercury, in scurvy, and other diseases, are not justly to be attributed to the medicine, but to the abuse of it. There does not seem much difficulty in accounting for the bad effects, which have arisen from the abuse of mercury in that disease. As the proper principle, upon which that and every other medicine should be exhibited, as not being understood, the mode in which it was applied in scurvy, must necessarily have increased the exhaustion, or converted the original state of accumulation, into a state of exhaustion; and the vicissitudes of weather, that usually occur on board of ships, would increase still farther the exhaustion. It is in this way, and upon the principles explained in the text, that cold proves so injurious, during the application of mercury, or other high exciting powers, when they are unskilfully exhibited. Scurvy, in fact, appears to be a disease mere-



ly general, and in its origin of slight degree ; at first arising from the subduction of nourishment, and the mental stimuli, and afterwards increased by an excessive, or irregular application of other exciting powers, and a continued negation of food sufficiently nourishing. Accordingly, the gradual re-application of food sufficiently nourishing, and of the mental stimuli, is alone, for the most part, sufficient to cure the disease. It is upon the principle of the gradual re-application of nourishment, that vegetables have been found at first preferable to animal food. And this fact it was, if the above reasoning be right, that led to the error, committed in the text, of considering scurvy as a disease of accumulation.

WITH respect to the excitement and excitability, a more elegant and just arrangement of the propositions might, no doubt, have been made. This defect, however, is not of material importance ; as the principles of the doctrine are still sufficiently intelligible ; and every one, who understands them, as they now are, will be able to judge what they ought to be.

AN early and sincere admirer of this doctrine, for whose judgment I entertain a respect, having expressed some doubts in regard to the non-existence of diseases of excessive excitement, and requested me to re-consider the subject, a defer-



ence for his opinion, and a wish to place the matter in a clearer point of view, induce me to enter upon a detail, which seemed at first unnecessary. As the entire rejection of diseases of excessive-excitement, is a great deviation from the original doctrine, and one of very considerable importance in its influence upon practice, I shall endeavour, by stating the grounds of it at some length, to obviate all reasonable objections to the theory. In this place, it may be proper to observe, that medical facts, as they have been called, are too often nothing more than a loose relation of circumstances. A fact, properly speaking, must be so evidently true, that every man, possessing sound organs, may discern it. And the general facts, or principles, which are inductions from particular facts, may also be discerned by all men of ordinary capacities, who will take the trouble of going through the necessary steps in reasoning. But where are the facts of this description, which prove that some diseases arise from what has been called, by Brown, a state of excessive excitement, and, by others, a state of plethora? If they can be produced, I will with much readiness acknowledge my error, in having denied the existence of such a state. Until that happens, however, there is no good reason why it should be taken for granted, upon mere *ipse dixit*. As in medicine, much useless



controversy might have been avoided, by attending to accuracy of expression, it may not be improper to explain the sense, in which the term "excessive excitement" is here understood. Excitement is meant to express the vigor, with which the functions of life are performed, in all their different degrees. But the functions of life can only be performed in a due, or in a deficient degree. To say that they can be performed in an *excessive* degree, is as great a contradiction in terms, as *excessive virtue*, or *excessive joy*; the one is *vice*, the other *pain*. When stimulant powers are applied in due proportion, the excitement is at the degree which constitutes vigor, tone, or health. But when they are applied, either in a deficient or an excessive degree, the power with which the functions of life are performed, i. e. the *excitement* is diminished. That power consists in a pleasant, easy, and exact use of these functions; which is certainly not enjoyed in the diseases, that have been referred to a state of excessive excitement. When a degree of stimulant power, higher than is necessary to the state of health, is applied, the functions of life will be performed with more than usual vigor, before they fall into a state of indirect debility; but never with *excessive* vigor. The *action* of the fibre may be excessive, but its *power* cannot.—If we trace the progress of the living



functions, in a person exposed to the action of high stimulant powers, it will be found, that their vigor is first increased to the highest point, and afterwards diminished in a degree proportionate to the excess. But if these powers be gradually subducted, that diminution will not take place; or if they be re-applied, it will be removed; unless the excess has been such as to occasion the destruction of organs. It will not, I believe, be denied, that the headach, sickness, &c. which arise after excessive drinking, constitute a state of indirect debility, which might have been prevented by the gradual subduction, and is to be removed by the re-application of stimulant powers. That a certain quantity of spirits, a ride, &c. will remove these symptoms, is a fact that is known, almost to every one. After excessive walking, or dancing, that state of indirect debility constituting fatigue, is not immediately induced. It becomes more severe the second and third day, unless, by a certain degree of walking, or dancing, or the substitution of other stimuli, in the intermediate time, it be prevented. After such an excess, rest is exceedingly injurious.\*—It is equally true, that the de-

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\* Dean Swift's mode of taking exercise, but in somewhat lower degree, was good. The regulation of exercise and the passions, is at present almost totally neglected, in the cure of



lirium, fever, &c. which arise from excessive exposure to the sun, from opium, æther, mercury, or any other stimulant power, applied in too high a degree, depend upon indirect debility; and that they may be prevented by a gradual reduction, or cured by a proper re-application of the same powers, or of others equivalent in force. None of these symptoms occur, during the action of the exciting powers; they always commence after these powers have been withdrawn. If this be denied, it must be supposed, that medicines lie dormant in the body for some hours, after having been taken; and then, all at once, begin to act. But headach does not instantaneously follow the application of spirituous liquors; delirium, or fever, the application of opium, or the solar rays; vomiting, the application of tartar emetic; salivation, the use of mercury; purging, the exhibition of cathartics; sweat, of sudorifics; nor vesication, the application of a blister, or of fire, to the skin.—On the contrary, these symptoms always appear sometime after the application of the exciting powers; and may be prevented by a gradual reduction, or cured by a judicious re-application of the same powers, or

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diseases. They are subjects which seem to be yet but little understood, although their importance to health and to morals are evidently great.



of others equivalent in force ; excepting, indeed, when the force of the noxious power has been so great, as to produce an immediate lesion of organs. Let us take a familiar case, as an example. Suppose an arm, or a leg has been exposed to the action of fire, no person, in his right senses, would think of plunging it into cold water, or snow, or applying ice. It is a fact well known, that ardent spirits, vinegar, and other stimuli of high degree, are the proper remedies ; and that, if applied in due time, and in sufficient quantity, they will prevent the inflammation, vesication, pain, and fever that would otherwise ensue. If the principle be established, in one case of excessive application of stimuli, it must equally apply to all. Every fact concurs in proving, that the bad symptoms which arise after an excessive application of the stimulant powers already mentioned, or of others, depend upon a state of indirect debility, *not* upon such a state as that of excessive excitement ; and that they are to be prevented or removed by the proper application, *not* by the subduction of stimulant powers.

If, to a person in health, a very high degree of heat has been applied, as in exposure to the rays of a burning sun, would it not be as dangerous to remove him suddenly into a cool, or even a temperate atmosphere, as it would, in the case



of a person, who had been exposed to a high degree of cold. In the one case the fact is universally admitted, and the principle applied to practice: Why not in the other? Is it more difficult to comprehend that, after an application of extraordinary stimuli, a sudden subduction of them should produce indirect debility, than that the same effect should follow a sudden re-application of the ordinary stimuli, after they have been for any time withheld?—Upon principles equally clear, the excitability in the one case, would not be accumulated; in the other, it would be exhausted. Hence it is evident, why cases of *coup de soleil* are so frequently fatal. I should think myself acting with equal propriety, in suddenly subducting, not only the high stimulant power of the solar rays, after having been for some time applied, (at least without substituting another stimulus nearly as powerful, and then gradually reducing it) but farther taking away a quantity of blood, and diminishing all the ordinary stimuli, as in plunging legs nearly frozen into hot water, giving a pound of meat to one who had been long fasting, and farther applying, to persons, in these states, opium, æther, or brandy. It is much to be regretted that, in this, as well as in many other cases, practitioners who are not themselves convinced of the efficacy of blood-letting, should think it incumbent up-



on them, from a false desire of reputation, or a regard to interest, to put it so frequently in practice. It is very true, that a conformity with the common practice is safest in a prudential view. For, if a patient dies of peripneumony, without the formalities of bleeding and purging, he will be said to have lost his life, in consequence of these omissions. But if he dies, after they have been duly performed, it is only from the necessity of his fate.

PERIPNEUMONY, in reality, is seldom a dangerous disease, until, by blood-letting and other debilitating means, inflammation and adhesion of membranes, suppuration, and dropfy are produced.—Has a person ever died in a state of excessive vigour? No, nor ever will. No danger, then, need be apprehended from such a state.

If it be a certain fact that opium, judiciously repeated, will prevent or cure those very symptoms, which an unskilful application of it may have produced; if, by the proper exhibition of mercury, that medicine may be given, not only without producing salivation, but so as to cure it; if the sickness and headachs that occur, after excessive drinking, may not only be prevented by a gradual diminution of the excess, but may be cured by the application of a certain degree of the same power. If, I say, all these be facts (and



they will be found so by those who will give them a fair trial) the inevitable conclusion is, that all the diseases in question, depend upon a state of exhaustion or of indirect debility, and are to be cured, by the application of stimulant powers, in a degree proportionate to the exhaustion.

FROM the general ignorance and neglect of this doctrine, the best adapted of these powers, to particular cases and degrees of disease, have not yet been well ascertained. But in proportion as it is more generally received, physicians, instead of random empirical prescriptions, will apply powers to living bodies, according to known principles, and with a view to particular effects. They will consider the living body as a whole, upon the state of which depends that of every particular part ; and they will desist from the hopeless task of prescribing for strangling symptoms. They will co-operate in discovering the relative powers, the duration of their action, and the best method of exhibiting, every substance that can be employed in medicine. While, in diseases of the highest degree, they will all probably employ the most diffusible stimuli, as opium, æther, camphor, volatile alkali, mercury, &c.\* ; in the lower degrees, each

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\* The powers of arsenic and other substances called poisons, are by no means well ascertained. But we have implements enough, if we knew how to use them.



may with advantage give a preference to his favourite medicine. And if he applies it, so as to support the excitement, health will be re-produced, whether he uses bark, or wine, salts, aloes, or gamboge ; castor oil, rhubarb, or cream of tartar.

NOTHING perhaps has contributed more to increase the confusion in medical doctrines, than the inaccurate language and loose reasoning, with which the cultivators of the art have found it necessary to veil the absurdities of their systems. The division of causes into proximate and remote, is a remarkable instance of this. It shews evidently that, in medical reasoning, POWER has uniformly been confounded with CAUSE. Many powers may combine to produce one effect ; but it is not any one of these powers, but the sum of the whole, that constitutes the *cause* of that *effect*. Thus, excessive heat,\* fatigue, bad news, noxious air, may all combine to produce a state of indirect debility. The cause of this state of indirect debility, is *not* excessive heat, fatigue, bad news, or noxious air ; *but*

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\* It is always to be understood, that excessive heat, or other stimuli applied in excess, relates to the state of the excitability, not to any particular standard of heat, or any degree of other stimulant powers.



the sum of all these powers. Again, indirect debility, in its various degrees, is the cause of all those symptoms which constitute diseases, depending upon that state, each of which has, in nosological systems, obtained a particular name. But, as there can be nothing intermediate between a cause and its effect, and as there can only be required one cause to produce one effect, *remote cause* is evidently a gross contradiction in terms. To say that any of the powers, the application of which will produce a state of indirect debility, is a *cause* of symptoms, which are *consequences* of that state, appears to me as great a perversion of reasoning, as it would be to affirm, that a man dies *because* he has been begotten. The one event undoubtedly precedes the other ; but they are not in the relation of cause and effect, as these terms are generally understood.

ANOTHER circumstance, which has contributed to prolong the public delusion, in respect to the uncertainty of medical principles is this. THEORY and HYPOTHESIS, I hope and believe more through ignorance than design, have been very generally confounded under the common name of OPINION ; as if it were impossible, that principles should exist, because they have not been discovered by system makers ; that, as all



medical systems which have hitherto been framed are erroneous, there cannot be a true one in nature ; or that man alone is that curious composition, that " fortuitous concourse of atoms," which nature, in a frolicksome mood, had exempted from the operation of laws, fixed, immutable, eternal.—It will be difficult, without the aid of inspiration, to reconcile assertions of successful practice, with a confession that it is founded upon conjecture. It will be equally difficult to account, with decency, for an opposition to a doctrine, of which the fundamental propositions are either self-evident facts, or inductions from numerous facts ; of which every proposition has an evident relation to every other, and the whole to every part. It might rather be supposed that the contention would be, who should apply the principles most correctly to practice.

To the ridiculous and vague objections, founded on the alledged danger of giving large doses of medicines, the following remarks, it is presumed, will be a sufficient reply. From the principles of the foregoing doctrine, it results that, in every disease, a sum of stimulant power equal, or nearly equal, to that which has produced the disease, must be applied, in order to effect a cure. It is only when the sum of the



powers so applied exceed that, which has produced the disease, that the medicines can do harm. In that case, and in that case only, they will produce a disease more dangerous, because higher in degree, than that which had previously existed. Hence it appears that, while in diseases of the highest degree, as plague, dysentery, and fevers, more especially in those cases in which organic lesion has taken place, the common doses of medicines is merely sporting with lives, in diseases, deviating but little from health, they, for the most part, exceed the just proportion. While, in some cases of the former, from four to five hundred drops of tincture of opium will be too little, in some cases of the latter, the usual quantity of from twenty to thirty drops, will be too much. Indeed in cases, deviating but little from health, those high stimulant powers are unnecessary, and ought not to be used. These conclusions will appear so evident, to all who understand the principles of the new doctrine, that it would be superfluous, and might seem impertinent, to dwell longer on that subject.

In like manner, it is evident whence the disputes, which have arisen among physicians, respecting the virtues of particular medicines, have derived their source. From want of just principles as a guide, the same power which proved useful



in the hands of one man, from a particular mode of application, has been found injurious by others, from a different mode of exhibiting it. Hence the virtues of the peruvian bark, since its first discovery, have been extravagantly extolled, and as unreasonably decried. Hence hemlock, which was so successfully used by the judicious Dr. Stork, entirely failed with other practitioners, and unjustly lost its reputation. Hence electricity, which, applied according to principle, I will venture to affirm, will be found a power of superior efficacy in the cure of diseases, has been greatly neglected; and when successful, has only been so by chance.\* And hence, more recently still, the inconclusive disputes concerning the effects of opium, and other substances of high stimulant power, applied to living bodies.

ONE of the most egregious mistakes which has been made, respecting the doctrine of life, remains still to be mentioned. It has been understood, or rather misunderstood, to consist entirely in the exhibition of opium; brandy, and wine,

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\* I have some opinions regarding electricity, as applied to living bodies, which I shall take an early opportunity of verifying, or disproving by experiment. If they prove true, it will throw much light on the principles of the doctrine.



in every case, and with no discrimination. To those who know it better, it must appear evident, that these substances have no more relation to the principles of the doctrine, than any other powers, that may be applied to the excitability. The free use of them, in a state of health, is even contrary to principle. But the laws of nature, as they respect living bodies, would seem, in the ordinary routine of custom, to have been nearly reversed. In a state of health, for the most part, too great a sum of stimulant power is applied; in a state of disease, generally too little. Suppose opium, brandy, and wine annihilated, the doctrine would remain entire. Provided the excitement be supported, it matters not by what power it is done. It is evident, then, that those, who have rested their opposition upon objections to any particular medicine, or the doses of medicines, could not have understood the subject. Indeed to understand is to believe in it. As soon will eyes, in a sound state, be unable to distinguish light from darkness, as a mind capable of comprehending the terms, can disbelieve the fundamental propositions of the doctrine of life. If this be true, can it be denied, that the doctrine has, by all its opponents, been either prejudged or misunderstood?



THIS is not a question of party ; but a contest between truth and error. It is not the judgment, dignity, or character of this or that individual, that is in dispute ; but the truth or falshood of a doctrine, whose principles embrace every part of animated nature. Whether discoveries have been made by a man named Brown, or a man named Cullen ; whether they have issued from the obscurity of a cottage, or the elevated desk of a professor, is of little consequence to the world. But it is of essential importance, that they should know the nature and extent of the discoveries. It is high time to bring the question to an issue. If the doctrine be true, it behoves those, who consider themselves as *multis experimentis eruditi*, avowedly to embrace it ; if false, they should, by reasoning, or a comparative trial, undeceive the rising generation, whose minds are rapidly receiving the infection.



A  
T R E A T I S E  
*ON THE ACTION OF*  
M E R C U R Y,  
*UPON*  
*LIVING BODIES;*  
*AND,*  
ITS APPLICATION FOR THE CURE OF DISEASES OF  
INDIRECT DEBILITY.

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BY *C H A R L E S M A C L E A N.*

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M,DCC,XCVII.



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## ADVERTISEMENT.

**T**HE following "TREATISE," is rather a History of the Manner in which Mercury has been applied, upon Principle, for the Cure of Diseases of indirect Debility, than a strict logical Disquisition.

*This mode was chosen in order to assert my Right, should the Theory hereafter be universally applied to Practice, to such Share of the Merit of the Discovery, as may appear to be justly due.*

*It is hoped that, in the present Form of the Treatise, the Proofs, although more diffused, will not be found less convincing, than if adduced in a more regular Series of Propositions.*

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A

TREATISE, &c.

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IN enquiring into the action of mercury upon living bodies, no attempt will be made to investigate its *modus operandi*, of which we are totally ignorant. It is the effects, whether salutary or noxious, that succeed the application of that power to living bodies, which will form the subject of consideration.

WHATEVER be the mode in which mercury acts, like every substance in nature, it can produce no other effect upon living bodies, than to increase or diminish the power, with which they perform their proper functions ;—in other words, to increase or diminish their excitement. All the substances in nature, which are capable, when applied to living bodies, of increasing or diminishing their excitement, are denominated stimulant or exciting powers. Should it, then, appear



that mercury will increase or diminish the excitement,—that it will both produce and cure diseases of indirect debility,—may we not, nay, must we not conclude that it is a stimulant or exciting power ?

THIS theory I had adopted in 1789 ; since which period, I have applied it to practice, in many cases, and with considerable success. The first trial was made upon myself. In January, 1789, on the passage from Bengal to England, having been seized with a quotidian intermittent fever, tartar emetic, and afterwards bark, with now and then a cathartic medicine, were, as usual, exhibited. Under this mode of treatment, I daily became weaker, and in the course of three weeks, during which the same plan was persisted in, my legs became œdematous, the paroxysms of fever more severe, and I could, with difficulty rise out of bed.

THE *evacuant* and *antiseptic* plans were now entirely abandoned ; and between two and three drachms of mercurial ointment, were rubbed upon my body, at bed time. The alteration, which this single rubbing produced, was equally unexpected and salutary. I slept the whole night ; and in the morning, awoke in a gentle perspiration, without fever, or pain, any disagreeable symptoms, excepting œdema and general debility,



remaining. The ointment was rubbed in, three or four times ; and I had no return of fever. My mouth was not affected; and I speedily got well. The issue of this experiment made a deep impression on my mind, and determined me, in future, to use mercury, in every case of intermittent fever. Having obtained a slight knowledge of the Brunonian doctrine, I thought myself in the state of the benighted traveller, to whom Brown, with so much justice and elegance, compared himself, upon the first discovery of his doctrine. \*\*\* “ *veluti viatori, ignotâ regione, perditis viæ vestigiis, in umbrâ noctis erranti, perobscura quædam, quasi prima diurna, lux demum adfulsit\**.” I inferred that mercury, in common with *many*† other medicines, was a stimulant power ; and would, therefore, be useful in all diseases of indirect debility. As, according to the same principles, it appeared that other fevers differed from intermittents, only in degree ; and as mercury was found a certain cure for intermittents ; I thence concluded that fevers, whatever their nosological distinctions, were the proper cases, by which to subject the theory to farther proof. One of the first instances, in which an opportunity of trying the practice in other

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\* *Elementa Medicinæ.*

† *All*, according to the present ideas.



fevers occurred, was the following.—Having made a voyage to Jamaica, in the interval of two voyages to Bengal, I was, early in 1790, on a visit to my friend, Dr. Hector Maclean, of Russel Hall, in the parish of St. Mary's. During my residence there, an European book-keeper upon the plantation, by name——Macmillan, was seized with typhus\*, or the common yellow fever of that country. When I first saw him, he was comatose and picking the bed cloathes; he had got some purges, and had been taking bark. His pulse was quick and small; his tongue black and furred; and he was supposed beyond the possibility of recovery. I represented to Dr. Maclean the good effects produced by mercury, in other cases of fever, and requested that he would permit it to be tried in this; to which, with a liberality, not always to be met with from established practitioners, he readily consented†. About an ounce of strong mercurial ointment was immediatly rubbed on the patient's body.

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\* It is almost unnecessary to observe that nosological distinctions are totally disregarded, as incompatible with the principles of the new doctrine. Generic names are, for convenience, sometimes retained.

† This gentleman had been a practitioner of reputation. But had then retired from the exercise of his profession, and resided on his estate.



But, as in typhus, this was a new experiment, I did not choose wholly to trust to the mercury ; and therefore desired that he might be allowed a wine glassful of Madeira every hour\*.

THE next day he was still insensible ; but sat up in bed, and searched, as it were instinctively, for the Madeira bottle. When it was given him, he would not consent to part with it ; but held it firm, between both hands, as if something, upon which depended his existence. The ointment was again rubbed in, by guess, twice in the day,—the quantity about half an ounce each time ; and the wine was continued. He was perceptibly getting better. The same treatment was persevered in ; and at the end of five days, from the commencement of it, he walked in the verandah, in a state of convalescence. It was sometime, however, before he entirely lost the fatuitous look, which has been noticed as a symptom of yellow fever. His face was a little swelled, and his gums slightly affected by the mercury. During convalescence, he took wine and bark freely.

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\* This is but a small quantity of wine in typhus fever.—In some cases it may be necessary to give three or four bottles, in the twenty-four hours. In others, wine, in any quantity, is not sufficiently powerful. Recourse must then be had to the more diffusible stimuli.



This recovery, although it appeared surprising, was still only regarded as accidental. The idea of using mercury in fevers was treated, by the generality of medical men, as an extravagant chimaera ; or, at best, a mere ebullition of Brunonianism, which they had learnt, at school, to consider as heretical.\* But these rebuffs by no means discouraged me from prosecuting my researches, as will appear from the following remarks, extracted from a medical journal, which I kept in the year 1790 :

“ MERCURY is universally allowed to cure lues  
 “ venerea. All writers on hepatitis concur, in ex-  
 “ tolling its virtues in that disease. I have ex-  
 “ perience its efficacy repeatedly in intermittent  
 “ fevers, once in typhus, twice in gout, and once  
 “ in bleeding discharges. A case is related in the  
 “ London Medical Journal of 1786, (page 413)  
 “ of obstructed menses, cured by calomel. Af-  
 “ fections produced in irritable habits, by the  
 “ transplantation of teeth, have also been cured

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\* From this it may be inferred, how well the doctrine has been understood, by those who have pretended to sit in judgment on it. The use of mercury as a stimulant power, results as an obvious inference from the medical principles of Brown. But not more so than tartar emetic, or salts. He did not perceive these inferences himself : from whence it will appear, that, instead of pushing the consequences of his doctrine too far, he did not extend them far enough.



“ by mercury ; and hence, these diseases have,  
 “ in my opinion, very erroneously been supposed  
 “ venereal.”

THIS conclusion, which is certainly not just, must have been productive of the most disagreeable consequences. The very idea would severely wound the feelings of delicate and modest females; among whom diseases, from the transplantation of teeth, have most frequently arisen. Besides the injury to the constitution, from an excessive use of mercury, supposing the disease to be venereal. In that disease, mercury is usually given, in much larger quantities than is necessary, and very seldom in such a manner, as to produce the best possible effects. In fact, ulcerations produced by the improper exhibition of mercury, may be cured by such an application of the same power, as to support the general excitement.—The same journal proceeds thus :

“ At it must be allowed that mercury, like every other powder, can have but one uniform operation upon living bodies, it may fairly be concluded, that all the diseases, which it cures, are of the same kind. And as some of these are certainly diseases of debility, the rest must be diseases of debility also\*. I infer therefore,

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\* This proposition, although of easy comprehension, does not seem to be generally understood. It means that all diseas-



“ with as much confidence as analogical reasoning  
“ can justify, that mercury is useful, in every dis-  
“ ease of debility †. But I would not be under-  
“ stood to prefer it in every case, nor totally  
“ to rely upon it in any. For, even in lues  
“ venerea, where it is generally a certain cure,  
“ it often requires the aid of other stimuli, par-  
“ ticularly opium, wine, and bark ; or to be al-  
“ ternated with them, when from habit, it begins  
“ to lose its effect.”

THE following case, extracted from the same journal, is the instance alluded to of gout and bleeding discharges, being cured by mercury.

“ MRS. E—— B——, of Kingston, Jamaica,  
“ aged forty years, had been accustomed to live  
“ freely, and was subject to frequent attacks of  
“ gout. Having been occasionally at her house,  
“ she sometimes asked my advice. In the course  
“ of a short space of time (for she was subject

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es, which can be cured by the same powers, must depend upon a similar state of the body, by whatever powers that state may have been produced. Thus the matter of small-pox, and the powers which produce dysentery, and typhus, must occasion a similar state of the body, differing only in degree ; for they are all cured by the application of the same powers, differing only in degree.

† It should have been *indirect* debility. These observations were originally written for my own amusement, without any intention of publishing.



“ to frequent paroxysms) she was cured of two  
“ attacks of gout, by mercury, opium, and the  
“ warm bath; but mercury was the principal  
“ power applied. On the 8th of August, 1790,  
“ she complained of an incessant menstrual dis-  
“ charge, alternating with a discharge of blood  
“ from the piles. These symptoms she said had  
“ commenced seven weeks before, occasioned,  
“ as she thought, by fear; and, for some days,  
“ had been accompanied with headach, pain of  
“ back, loins, and other feverish sensations.—  
“ Her stomach was very irritable, and could bear  
“ nothing liquid in the morning, excepting wa-  
“ ter, accidulated with elixir of vitriol, or ginger  
“ tea. She had a troublesome cough, and pain  
“ in her side, which she supposed to arise from  
“ the affection of the liver. This idea she was  
“ rather encouraged to entertain, that an op-  
“ portunity might be got of trying the effects  
“ of mercury, in bleeding discharges. Two  
“ drachms of mercurial ointment were rubbed  
“ on her body in the evening, and she was de-  
“ fired to take a draught, with forty drops of  
“ tincture of opium, every four hours, through-  
“ the night. Her legs were immersed in warm  
“ water. She was advised to take solid food  
“ only; and to use for drink, water strongly  
“ accidulated with elixir of vitriol, or ginger  
“ tea. August the 9th, the ointment and lau-



“ danum had been used as directed. She had no  
“ fever ; her headach was less severe ; and she  
“ perspired freely. The menses ceased to flow,  
“ and discharge commenced from the piles.  
“ She was still encouraged to believe that her  
“ liver was affected ; and the medicines were  
“ ordered to be continued. August the 10th,  
“ she was in all respects better. The discharge  
“ from the piles was considerably less.—One  
“ drachm of ointment only was rubbed in, and  
“ the tincture of opium was omitted. 11th, the  
“ ointment was once more rubbed in. The dis-  
“ charge from the piles entirely ceased ; and she  
“ had no return of any of her symptoms.”

THOSE who are inclined to question the efficacy of mercury, in diseases of indirect debility, may object that, as other powers were, in this case, combined with it, the cure cannot fairly be attributed to the mercury alone. That is very true. All the other powers performed their respective parts. But, from a thousand analogies, I think it may be affirmed, that mercury alone would have been sufficient. In general, when several powers can be applied to different parts of the body, either in concurrence or succession, so as to support the excitement regularly, and with equality, it is much better to have recourse to many, than to trust entirely to one.



THE effects of mercury, in fevers and other diseases of indirect debility, were mentioned in conversation with medical men, in many parts of the Island of Jamaica; most of which I visited in 1789-90. The idea, as usually happens, was endeavoured to be ridiculed, and the facts to be discredited. It has since that period, however, come into general practice in Jamaica, the other West-India Islands, and in America, as appears from Dr. Duncan's Medical Commentaries, for 1795\*. By this history, it is not intended to claim any more merit for the introduction of that practice, than each reader may be disposed to allow. Provided the facts be admitted, the origin and progress of the discovery is of little consequence. As the practice, in so far as it is good, is but a mere application of the principles of Brown, the whole merit of it is, in my opinion, justly and solely due to the doctrine of that most ingenious physician.

THE following extracts, from the Medical Journal of the English East-India Company's ship Northumberland, in the years 1791 and 1792, will farther shew the manner, in which the application of mercury, upon the same principles, was extended to diseases, in which it had never, to my knowledge, been used before.

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\* Page 348 to 354.



“ JOHN HURST’s case\*, is a proof of what  
 “ I have experienced on several occasions, and  
 “ first of all tried upon myself,—the efficacy of  
 “ mercury in intermittent fevers. In all the  
 “ cases (not less than ten or twelve) in which  
 “ the experiment was fairly made, I have not  
 “ known it to fail once, where the mercurial  
 “ ointment was used in such quantity as to  
 “ affect the mouth. The soreness of the mouth,  
 “ seems to be a sign, that the system is sufficient-  
 “ ly excited, to overcome diseases of debility†.  
 “ A man in health, or in a state of high vigor,  
 “ is much sooner affected, than a person in a low,  
 “ languid condition. In the case of John  
 “ Hurst‡, William Smith§, — Cummins||,  
 “ and Paul Harris¶, the quantity of mercury

\* A case of intermittent. The observations refer to particular cases in the journal.

† This is incorrect. The soreness of the mouth arises from a state of indirect debility, in consequence of the sudden subduction, or irregular application of mercury.

‡ Intermittent—§ Jaundice—|| Ophthalmy—¶ Hectic fever—These patients were prescribed for, without any other rule, than to rub in a certain portion of mercurial ointment daily, until the disease should cease, or the mouth become affected. But this as I have since found, is not a proper mode of exhibiting mercury. As it was not supposed to act in any *specific* manner, its operation was supported by opium,



“ used before salivation was produced, seemed  
“ to be inversely as their vigour. This propo-  
“ sition is farther confirmed by a fact well known  
“ to practitioners—that by premising blood-let-  
“ ting, more opium or mercury may be *safely*  
“ thrown into the system.”

ALTHOUGH it is rather deviating from the subject, it is worth while to pause a moment in admiration of the rule of practice, founded upon this fact. First, to draw blood, to have afterwards the pleasure of introducing more opium, or mercury into the system, than could otherwise have been done; to debilitate, in order to strengthen; to accommodate the patient's habit to the quantity of medicine that is to be given, rather than proportion the quantity of medicine to the state of the patient; these are rules so wonderfully sublime, that they can never be sufficiently admired! If it were permitted, upon such subjects, to reason in a plain way, I would ask, if a patient's excitement be five degrees below the healthy standard, how can any rational being think of lowering it five degrees more,

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camphor, wine, bark, the warm bath, and blisters, according to circumstances. The principles, however, were not always correctly applied. Nor does it seem to be any valid objection, that a knowledge of their application is not to be acquired by intuitively.



that he may afterwards raise it, with the greater safety? He will then require to apply double the force, that would at first have been sufficient. The Journal goes on to observe, that “mercury affects the mouth much sooner, when opium, blisters, the warm bath, or any other of the more powerful stimuli are used at the same time. In the case of Willian Kirk, the additional stimulus of the warm bath speedily accomplished what opium, mercury, and wine did not effect for a fortnight.”

THIS patient had the usual symptoms of chronic diarrhœa, with a considerable degree of hectic fever, emaciation, and entire loss of appetite. Externally he used mercury, and internally opium and wine, according to circumstances. It was found necessary to alternate these stimuli with others, such as blisters and the warm bath. He used to remain a quarter of an hour in the bath, heated to as great a degree as he could easily bear. It was not tried, until after he had been a fortnight using mercury. After having used it twice, his mouth became sore. There was an increased flow of saliva, and he recovered in a very short space of time, to the great surprise of all who saw him; and, I confess, contrary to my own expectations. It now, however, appears, as a case of disease, by no means dangerous, if treated in a manner, but distantly ap-



proaching to the exactness of scientific principles. The following remarks are in prosecution of the same subject:—"In June, 1791, we had  
"from thirty to forty soldiers, ill of fevers,  
"catarrhs, and rheumatisms, and many more  
"with various trifling ailments, whose cases were  
"not entered in the Journal. The similarity  
"of their diseases and treatment, rendered it  
"unnecessary to record any, excepting the most  
"dangerous. In every case in which mercury  
"was given, so as to produce salivation, the  
"pulse rose, and all complaints gave way, as  
"soon as the mouth was thoroughly affected.  
"But in some cases, that was found very diffi-  
"cult to accomplish; and in others, I was afraid,  
"although perhaps without just grounds, to push  
"the medicine to a great extent, particularly in  
"diarrhœa and dysentery."

THIS groundless apprehension, arose from a knowledge of the purging effects that succeeded the use of calomel, and other mercurial preparations; and from erroneously supposing that a medicine, which, exhibited in one way, produces purging, cannot, if exhibited in another way, cure diseases, of which purging is the principal symptom. But farther reflection and experience, soon banished this remnant of scholastic prejudice.



I SHALL give one extract more, from the observations upon this subject, made on board the Northumberland, in April, 1792. “In every  
“case of low fever, which occurred among the  
“soldiers, on the passage to India, from the moment the mouth was effected\*, a recovery  
“commenced. But as the mercury was used  
“externally only; and as, in some cases, the  
“mouth could not, in that manner, be affected  
“(which cases never terminated favourably)  
“might not the internal use of that medicine  
“prove more effectual? And would it not be advisable to exhibit it, in small doses, frequently  
“repeated, until the desired effect is produced?”

As the foregoing observations were not originally designed for publication, it was found

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\* By affection of the mouth, is meant an increased flow of saliva. When a free and increased flow of saliva takes place, such as constitutes salivation, a recovery will always ensue, if the succeeding treatment be right. But the mouth, gums, fauces, and tongue may be ulcerated, without an increased flow of saliva being produced. In those cases, many facts authorise the conclusion, that no recovery will take place. Internal local disease, of the thoracic or abdominal viscera, or both, will be found upon dissection. These appearances have been so uniform, in many cases which I have opened, that I can now venture nearly to predict, in what state the viscera will be found, where the mouth cannot be affected, so as to produce an increased flow of saliva.



impossible to copy them literally from the journal. In many places, therefore, words are altered to render them less unfit for publication ; but no alteration is any where made in the sense. The journal, from which they are extracted, was examined by the English East India Company's physician, in August or September, 1792, and afterwards deposited in their warehouse.

From that period, my confidence in the powers of mercury, for the cure of all diseases of indirect debility, became so decided, that I determined to apply it in every case, in which the ideas of my patients would admit of the practice,—even in diarrhoeas, and dysentery, the diseases in which the theory seemed most difficult of reconciliation. With respect to the diseases that were considered as depending upon a state of excessive excitement, although I much doubted the existence of such a state, yet my ideas were by no means sufficiently clear in regard to it. An opportunity having soon occurred of putting it to the test of experiment, in my own person, it was eagerly embraced. In September, 1793, after having been exposed a whole day to the heat of the sun, in an open boat, upon the river Hooghly, I was seized, in the evening, with symptoms of high fever. According to the common practice, I should immediately have lost blood, taken an emetic, or purgative, and abstracted as far as



possible, all the usual and ordinary stimuli. Instead of that, a pill, consisting of one grain of opium and one grain of calomel, was taken every hour, through the night. By this means, the excitement was sufficiently supported, and I remained easy, with an abatement of all the febrile symptoms. On the following morning, a considerable stiffness, swelling, and pain, affected my left arm, from the shoulder downwards; and it had assumed a kind of livid appearance, rather alarming. This arm, from the situation in which I stood in the boat, had been more exposed to the direct rays of the sun, than any other part of my body. It was bathed with tincture of opium, and rubbed with mercurial ointment alternately; and the pills were continued. After having taken about thirty pills, my arm began to return to its usual state, and all the other symptoms disappeared. The pills were omitted; and I found myself quite well.—From eight to twelve hours, however, after the pills were omitted, my mouth, all at once, became very sore. A discharge of blood from the fauces and gums soon commenced, which continued troublesome for two days, and ended in salivation. Had I then adverted to the fact, that a sore mouth and salivation are not produced by a regular exhibition of mercury, but by the irregular exhibition, or sudden subduction of it, these



troublesome and disagreeable symptoms might easily have been avoided ; or if, by neglect, they had been allowed to occur, they might as readily have been cured. The fever did not return ; and I was soon restored to health. This fever, after a bleeding or two, would most probably have assumed the appearance of peripneumony, which, according to the medical hypotheses of the schools, would have indicated still farther bleeding, and other evacuations. And there is little doubt that, under such treatment, it would have terminated, at the best, as so many cases of acute diseases do, in this country,—in adhesions of membranes, local affections of the viscera, or a very lingering recovery\*. But let me not be misunderstood. It is the bleeding alone which I condemn in so unqualified a manner. The cathartics, sudorifics, &c. employed

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\* In consequence of a conversation that took place, after writing this treatise, the following note, extracted from the 9th vol. of the Edinburgh Medical Commentaries, was sent me, “ Dr. Robert Hamilton, of Lynne Regis, on eighteen years experience, recommends mercury, joined with opium, “ in inflammation of the liver, peripneumony (even in women “ far advanced in pregnancy) inflammatory gout, wounds .of “ the head, thorax, abdomen—from one to five grains of calomel, and from  $\frac{1}{4}$  to one grain of opium, every six, eight, “ or twelve hours.” This most excellent practice was, in all probability, opposed at the time, in order to support some ridiculous hypotheses of the Schools.



in these diseases, although by no means given with the proper view, and therefore seldom given in a proper manner, are, upon the whole, productive of more good than harm. Their effect is always to increase excitement, and the state of indirect debility, which succeeds their operation, constituting purging, sweating, &c. arises from their not being repeated afterwards in such a regular manner, as to produce the highest excitement.

Soon after this period, an opportunity occurred of giving mercury a very fair trial, in diarrhoea and dysentery, almost the only diseases in which I had not yet ventured to apply it. Early in the year 1794, I was on board the English East-India Company's ship *Houghton*, composing part of a squadron on a cruise against the French, and designed for the protection of Batavia. The crew of the *Houghton*, in consequence of the ship's having been ill manned, some peculiarities in the internal œconomy, and having been stationed, at the port of Batavia, a month longer than the other ships, suffered much from sickness. A very great proportion of the seamen were seized with diarrhoeas, fevers, and dysenteries, the severest that I had ever seen. The European soldiers and lascars\*, being subject to

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\* We had on board a company of European infantry, and a company of gun lascars, from Bengal.



different regulations, enjoyed a tolerable exemption from disease. Upon this occasion, the inefficacy of the treatment, recommended by authors and teachers, in severe cases of dysentery, struck me in the most forcible manner. The usual doses of medicines produced no perceptible effect. In this dilemma, it was determined, as had been successfully practised upon other occasions, “to use opium, camphor, mercury and other stimuli, both internally, and externally, until the disease was cured, or a salivation produced. In every case, in which the mouth was affected, a recovery with certainty ensued\*. Blisters and wine were used, with great advantage, as auxiliaries”. These remarks are taken, with some trifling alteration in the language, from a copy of the Medical Journal, kept on board the Houghton, in 1793 and 1794†.

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\* But in those cases, in which the mouth could not be affected, so as to produce an increased flow of Saliva, not one recovered. This remark was omitted in the journal, having been supposed to follow as a necessary conclusion from the other. But as, upon a more attentive consideration, that does not appear to be the case, it is proper that both circumstances should be explicitly stated. I was sometimes deceived by an appearance of soreness of the mouth, and left off the medicine prematurely.

† THE Journal itself ought to have been deposited, as usual, at the India House. But I am informed, that it has either



THUS it appears, that the efficacy of mercury has been experienced in almost every disease of indirect debility. In the East and West Indies, and in America, it has been found a cure for the yellow fever of these climates. But it has not been exhibited with the view, or in the manner, in which alone it can produce the best possible effects, viz. so as to support the excitement. Dr. Chisholm, indeed, has approached the nearest to the proper mode of exhibiting this medicine, without however seeming to understand the principles. It is more surprising that Dr. Rush, who appears to understand the fundamental principles of the doctrine of life, should not have applied them, in the treatment of the yellow fever of Philadelphia. His attributing the cure to the purging operation, which succeeds the use of calomel, shews how difficult it is to erase early impressions, however erroneous, even from the most vigorous mind.

If opium, wine, and bark failed in cases of yellow fever oftener than mercury, as is said to have happened at Philadelphia, it must have arisen from the former having been exhibited in deficient quantities, while the latter was given more freely.

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Some mislaid, or, for private reasons, wilfully suppressed, by the commander of the Houghton, on his passage to Europe. A copy of the remarks, however, has been forwarded to the Council of Directors.



It will often happen that the prejudices of practitioners, as well as of the multitude, will render the choice of one medicine more eligible than that of another, when there is no difference in other respects. The circumstance of calomel being succeeded by purging led, by chance, to a proper practice. But I cannot admit, with Dr. Rush, that it was "the triumph of a medical principle." The disease would have been cured by any mode of treatment capable of supporting the excitement, in such a manner as to admit of an accumulation of the excitability.

THAT the opinion is erroneous, needs no other proof than this fact, that, in all diseases, a cure will be better effected, when the medicine is repeated at such intervals, as not to produce purging; but to support the excitement in a regular manner. A cure will also be performed, by the external application of mercurial ointment, without producing purging, as well as by the internal exhibition of calomel. Neither is salivation, sweating, or an increased discharge of urine, necessary to the cure. On the contrary, these symptoms, all of which in their different degrees depend upon a state of indirect debility, should, as far as possible, be prevented. Salivation is, no doubt, an unequivocal proof of the original disease having been removed; for, being itself a disease of indi-



rect debility, occasioned by the sudden subduction of mercury, or its repetition at improper intervals, it cannot co-exist with any other disease. Although, therefore, in diseases of very high degree, salivation is so far a desirable symptom; yet as the disease, if not incurable, may be cured without it, it ought as far as practicable, to be avoided. There are however, two conditions necessary to this. The first is, that the practitioner should know the principles, and the manner in which they are to be applied to practice: the second, that the patient should conform exactly to his directions. When these circumstances happily concur, according to any facts that are yet known, there is not a single disease of indirect debility, in which an organic lesion has not taken place, that may not be cured, without producing either purging, or salivation\*.

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\* Two ingenious papers, on the use of nitric acid in the cure of diseases, were, some time ago, published at Bombay, said to be written by Dr. Scot, of that place. Upon perusing them, I was led to institute some experiments with that medicine. For reasons unnecessary to mention, they were not completed. But there were sufficient grounds to infer, that Dr. Scot's statement of its effects was faithful, and not overcharged. In chronic cases of disease, of every kind, it produced good effects; and, in several cases, after the nitric acid was laid aside, a very small quantity of calomel was succeeded by salivation. The inference is obvious. It produced an ef-



ON the contrary, all evacuations, in so far as they exceed the degree that takes place in the healthy state, are symptoms of indirect debility ; and ought therefore to be avoided.

FROM the cases annexed to the “ View of the “ Science of Life,” and from the preceding account of the application of mercury for the cure of diseases of indirect debility, as well as from the history of some hundred cases which have

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fect upon the mouth, similar to that which arises from mercury ; and, if a considerable degree of salivation seldom ensued, in the cases in which I tried it, that probably arose from its not having been given in sufficient quantity.—The ingenious author of the papers alluded to, it is hoped, will find leisure to trace the analogy, between mercury and nitric acid, more in detail ; and to give his ideas to the public in a less perishable shape, than a news-paper essay. The discovery is the more entitled to our respect, as it was the result of reasoning, not of accident. Perhaps the large quantity of fluid, necessary to dilute the acid, may be an objection, where the less bulky preparations of mercury can be used with more convenience. But it will often be found a pleasant drink : and may, with advantage, be alternated with the preparations of mercury. I usually began by giving from sixty to a hundred and twenty drops, of highly concentrated acid, in a quart of water, in the 24 hours.



come within my knowledge, I think myself warranted in drawing the following

### CONCLUSIONS :

#### I.

THAT mercury applied to living bodies, in due proportion, will increase the excitement, and thereby cure diseases of indirect debility, in their various degrees.

#### II.

THAT, applied in an excessive degree, or in an irregular manner, it will induce a state of indirect debility, in its various degrees.

#### III.

THAT this state is indicated by ulcerations of the throat, soreness of the mouth, salivation, purging, sweat, an increased flow of urine, sometimes strangury, and costiveness, &c.

#### IV.

THAT in the exhibition of mercury for the cure of diseases, all these symptoms should, as far as possible, be avoided.

#### V.

BUT as in diseases of high degree, in which large quantities of mercury are required, it will for the most part be difficult, and often imprac-



ticable to conform to prescriptions, with the necessary exactness ;\* it is much safer in such cases, to run the risque of producing these symptoms, than to give such an under proportion as not to remove the disease.

## VI.

THAT the duration of the action of each dose of mercury, upon the living body, appears to be not less than one or more than two hours. This, however, is not considered as a point yet established, with sufficient precision.

## VII.

BUT whatever be the duration of its action, such exactly is the period at which the doses should be successively repeated, so as to support, in a regular manner, the excitement.

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\* If in the application of mercury, the judgment of the physician, and the punctuality of the patient, should even co-operate in ensuring a perfect conformity to principle ; the intervals of sleep will often be sufficiently long to occasion a sore mouth, an increased flow of saliva, griping, purging, or any of the other symptoms of indirect debility. Few patients, under a course of mercury, according to the usual mode of exhibiting it, entirely escape these symptoms. But in proportion as the principles and practice here inculcated are better understood, it will be more in the power of practitioners and patients, so to regulate their conduct, as to prevent, for the most part, those disagreeable occurrences.



## VIII.

ULCERATIONS of the throat, soreness of the mouth, salivation, purging, strangury, costiveness, &c. arise, *not* from the immediate action of mercury, *but* from its irregular application, or sudden subduction\*.

## IX.

WHEN, in consequence of an injudicious application, or sudden subduction of mercury, these symptoms of indirect debility occur, they may be cured by the same, or other exciting powers, applied in a degree proportionate to the exhaustion of the excitability.

## X.

MERCURY may, upon these principles, be given in much greater quantity, and with much better effect, than could have been done, according to the old mode of exhibiting it; and without producing salivation, or any other symptom of indirect debility.

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\* If any one affects to doubt this fact, let him take one grain of calomel every hour, for twenty or thirty hours, and then stop. He will find that his mouth does not become sore while he is taking the calomel, at regular periods, but some hours after having left it off; that the soreness will continue to increase for some time after having desisted from taking the medicine; and may be diminished, or removed by a proper re-application of the same power.



## XI.

As, in the cure of those high degrees of exhaustion, constituting dysentery and fevers, mercury has been found to be one of the most useful medicines ; and as plague is a disease, depending also upon a very high state of exhaustion, it is inferred, that mercury will be found proportionally useful, in the cure even of that pestilential and fatal disorder.

## XII.

EVERY case of disease, in which an increased flow of saliva succeeded the use of mercury, terminated in recovery.

## XIII.

EVERY case in which ulceration of the gums, fauces, and tongue, or a discharge of blood from these parts took place, without being accompanied or succeeded by an increased flow of saliva, terminated in death.

## XIV.

IN all the cases, which, under these circumstances, terminated fatally, extensive local disease of the abdominal or thoracic viscera, or both, was found upon dissection\*.

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\* In a word, infinitely the worst in the Calcutta General Hospital, and perhaps in all India, I opened, during the most



## XV.

FROM all these facts I conclude, that lesion of particular organs, such as to render them unfit for the performance of their proper functions, is the state which constitutes an incurable disease,

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unhealthy months of the year, the body of every patient that died under my charge. The appearances were recorded on the books of the Hospital. In every case, there was an extensive lesion of some of the primary organs. Several livers weighed each between five and six pounds, and one nearly eight. Some of them contained above a pint of thick pus; and that which weighed near eight pounds, contained above a quart. In some cases, cartilaginous, in others boney substances, were found in livers, in which there were no traces of recent suppuration. They seemed to be concretions formed from purulent matter. There were generally, in these cases, ulcerations of the cœcum, colon, and rectum. In one case of fever, the substance of the spleen was quite dissolved. It had the appearance of dark coloured mud, without a single trace of a blood vessel remaining. The most urgent symptom, in that case, was a raging thirst. The treatment, in every instance of disease of high exhaustion, was conducted on the same plan that was pursued in the foregoing cases. And I have the satisfaction to say, that I did not lose a single patient, who came under my charge in the incipient stage of disease. But as it is not my design to set my own judgment in competition with that of any other person, I will only affirm, that the practice resulting from the principles of the new doctrine, was in general infinitely more successful, than the common mode of practice, in like cases, has ever been in my own hands. That of Dr. Yates, and Mr. Brydie, founded upon the same principles, was attended with undeniable success.



when the foregoing principles are skilfully applied.

### XVI.

To what degree a lesion of organs, of primary importance to life, may take place consistently with the re-establishment of health, is a point that is by no means ascertained. We have now, however, one criterion by which to judge, with tolerable accuracy, when organic lesion actually exists.

THE prosecution of this subject, conducted upon the principles which have now been explained, may be attended with important advantages to the practice of medicine; and it is hoped will not be neglected by those, who wish to exercise their intellectual powers upon subjects of real importance.



when the foregoing principles are skillfully ap-

plied to the treatment of the disease.

To what degree a lesion of organs; of primary

importance to life, may take place consistently

with the re-establishment of health, is a point that

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A  
DISSERTATION  
ON THE SOURCE OF  
EPIDEMIC  
AND  
PESTILENTIAL  
DISEASES;

IN WHICH IS ATTEMPTED TO PROVE, BY A NUMEROUS  
INDUCTION OF FACTS, THAT THEY NEVER ARISE FROM  
CONTAGION, BUT ARE ALWAYS PRODUCED BY CERTAIN  
STATES, OR CERTAIN VICISSITUDES OF THE ATMOSPHERE.

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By CHARLES MACLEAN.

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1797.



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“ SCIENCE has much to deplore from the Multiplicity of  
“ Diseases.—It is as repugnant to truth in Medicine, as  
“ Polytheism is to Truth in Religion. The Physician who  
“ considers every different Affection of the different Systems  
“ in the Body, or every Affection of different Parts of the  
“ same System, as distinct Diseases, when they arise from one  
“ Cause, resembles the Indian or African Savage, who con-  
“ siders Water, Dew, Ice, Frost and Snow, as distinct Es-  
“ sences: while the Physician, who considers the morbid  
“ Affections of every part of the Body (however diversified  
“ they may be, in their Form or Degrees) as derived from  
“ one Cause, resembles the Philosopher, who considers Dew,  
“ Ice, Frost and Snow, as different Modifications of Water,  
“ and as derived simply from the Absence of Heat.

☞ See an Account of the Bilious Yellow Fever, By B. Rush,  
M. D. Page 177.

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# DISSERTATION

ON THE SOURCE OF

*EPIDEMIC AND PESTILENTIAL*

DISEASES, &c.

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**I**N endeavouring to promote knowledge, it may sometimes be as useful to correct ancient errors as to promulgate new discoveries. In medicine, doctrines of the greatest importance have been handed down from generation to generation, which altho' demonstrably false, have never once been called in question. The supposed existence of contagion in plague, dysentery, and fevers, appears to me, to be a very remarkable instance of this propensity in man, to pursue the beaten tract, however unprofitable or unsafe. Is not this conduct often the effect of selfishness, choosing to avoid the responsibility of innova-



tion ? And is it not for the same reason, that erroneous doctrines generally remain longer undisproved, in proportion to the extent of their influence upon practise ? However that may be, it is certain that contagious matter has, in all ages, been considered, by the multitude, as the cause of plague, dysentery, and fevers,—by far the most destructive diseases that affect the human race. And this hypothesis, upon the belief of which must have depended, and may yet depend, the lives of millions of our fellow-creatures, seems to have been implicitly assented to, by every physician, from Hippocrates to the present day.

ALTHOUGH I had long entertained doubts upon this subject, it was not till very lately, that I was led to consider it, with particular attention. Upon perusing Dr. Rush's publication on the yellow fever, which desolated Philadelphia in 1793, all my former doubts recurred, with ten fold force ; and the history of that epidemic, served to complete my conviction, *that no general disease, which affects a person more than once during life, can ever be communicated by contagion.* But as this term may be variously understood, it may not be improper to give a definition of it in this place. Contagion I conceive to be—a specific matter, generated in a person affected with disease, and capable of communicating that par-



ticular disease, with or without contact, to another.

WAS it a matter of mere idle speculation to inquire into the truth of this hypothesis, not less respectable from its antiquity than from the universality of its adoption, I should have been entirely silent. But the frequent recurrence and great mortality of epidemic and pestilential diseases, in many parts of the globe, render it an object of the most essential importance to ascertain, whether they are ever contagious. That they never arise from that source, I shall endeavour to prove, in the following manner :—

1st—By shewing that consequences would necessarily result from the existence of contagion in epidemic and pestilential diseases, which do not actually take place.

2dly.—By shewing that the existence of contagion, has always been taken for granted in these diseases, not only without any proof, but even contrary to the evidence of numerous and convincing facts.

3dly—By pointing out the real source of such epidemic and pestilential diseases, as have usually been reputed contagious ; viz. a certain state or certain vicissitudes of the atmosphere, toge-



ther with the casual application of other powers, producing indirect debility\*.

I—CONSEQUENCES would result from the existence of contagion, in epidemic and pestilential diseases, which do not actually take place.

If a person be affected with any contagious disease, it will necessarily be communicated to every other person who comes within the infectious distance †, and is not at the time labouring under some disease higher in degree ‡. But it is well known, to every one conversant in the subject, that in plague, dysentery, and fevers, a very small proportion only of those, who come within what may be supposed to be the infectious distance, or even in contact with the sick, is seized with these diseases. In the most universal epidemic, it does not appear that a tenth part of the whole inhabitants of a city, has ever been, at

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\* When any reference is made to general medical principles, in this Dissertation, they are understood to be those of the *Elementa Medicinæ Brunonis*, with the modifications of that doctrine, contained in the preceding "View of the Science of Life."

† By infectious distance, I do not mean to express any definite space, but merely the distance at which contagion is supposed to act.

‡ Vide prop. viii. View of the Science of Life.



one time, affected. But let it be supposed, that every sixth person might have been seized; is it credible that the remaining five sixths were, either, not within the infectious distance, or were at the time, labouring under some disease higher in degree, than the prevailing epidemic? If it even be admitted that, in a terrible pestilence, one half of the inhabitants of a city, may possibly be affected, the supposition that the other half could escape, if the disease was contagious, would be more extravagant; for the greater the number affected, the less chance must any individual have, of being exempted from contagion. Allowing that one person in ten may not have been within the infectious distance; and that one in an hundred may have been labouring, at the time, under a more severe disease, than the prevailing epidemic; such is the exact proportion that would escape. The reverse, however, is probably true. But whatever may be the proportion of the number seized, to those that escape, it cannot be doubted that the application of powers, which produced the disease, in the person first affected, is adequate to produce the same effect, in all those, who are subsequently seized.

As the fact cannot be denied, that a great majority have escaped, after contact with persons ill of diseases supposed to be contagious, attempts may perhaps be made to account for it, by sup-



posing a certain peculiarity of constitution, which exempts from, or disposes to disease. Is it the many, who escape, that have this happy peculiarity of constitution ; or the few, who are seized, that are so unfortunate as to possess it ? The former are evidently too numerous to admit of such an hypothesis. The property must, therefore, I conclude, be given to the latter. But a child, here and there, is exempted from small-pox, although exposed to its contagion. In order to preserve a consistency, this fact must be accounted for, by the same, or another peculiarity of constitution. Peculiarities of constitution, then, exempt from contagion in one case, and dispose to it in another : and thus a term, which in reality means nothing, may be made to account for any thing. For my own part, I must confess my inability to comprehend any other *peculiarities of constitution*, or *idiosyncrasies of habit* than what are constituted, by the different degrees of health and disease,—the different states of the excitability.

It appears, therefore, wholly unnecessary, for any purpose that I know, to suppose that, in epidemic and pestilential diseases, contagious matter is generated in those individuals who are first seized, and from them communicated to others ; unless indeed, it be determined, at all events, to take the existence of such a power for granted.



It is a well known law of nature, that small-pox, meazles, and other general diseases, which are unquestionably contagious, occur, in the same person, only once during life. It is also acknowledged by every author, who has written upon the subject, that plague, dysentery, and fevers affect the same person, as often as the powers which produce them are applied. Dr. Alexander Russel, affirms of the plague "the having had this distemper once, does not prevent the contracting it again. I have seen instances of the same person being infected three several times, in the same season." A similar observation is made by Dr. Rush, respecting the yellow fever of Philadelphia. Cases of reinfection," says he, "were very common during the prevalence of this fever."

SMALL-POX, meazles, and other general diseases, which occur only once during life, never disappear, until the whole of those who have been within the infectious distance, and were not, at the time, labouring under some disease higher in degree, have received the infection. As these diseases are very mild\*, children sometimes resist the power of contagion, from the superior force of

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\* They are not diseases of excessive excitement, but of indirect debility, and generally of a low degree.



other diseases, although they may be so slight as to escape common observation. I will venture to assert that no person, in perfect health, ever was, or can be exposed to the power of contagion, without receiving the specific disease, which that contagion produces; excepting in small pox, measles, &c. when the person has previously the disease.

PLAGUE, dysentery, and fevers, then, as they are not subject to the same law, would, if they were contagious, never disappear. The contagion, meeting with no obstacle from other diseases, feverer in degree (for there are few indeed of that description) would exercise an unlimited and fatal sway. No person could escape. Those, who once recovered would, again and again, be seized. Infection would proceed, in a continued circle, until the whole human race was extinguished.

2. THE existence of contagion in plague, dysentery, and fevers, has uniformly been taken for granted, not only without proof, but even contrary to the evidence of numerous and convincing facts.

It is well known, that, in hospitals, camps, and ships, a very small proportion only of those, who sleep within a short distance of, are frequently in conversation, or even in contact with, per-



sons ill of typhus, dysentery, or fever, is seized with these diseases. So far from infection being invariably communicated in this manner, no instance of it has ever been distinctly traced. If such cases had ever been recorded, we must either reject them as false, or abandon one of the fundamental axioms of philosophy. For, whatever has happened once, must happen often; it must happen always, in similar circumstances. But in the situations alluded to, these circumstances constantly occur, and the alledged effects do not follow. It is not fair to conclude, that dysentery is contagious, because one person happens to be taken ill, while in the neighbourhood of another, who has got the disease. If the conclusion was just, all within the infectious distance, not labouring under a disease higher in degree, would be similarly affected. They would have the disease with as much equality of force as children have the small-pox. In proportion to the number affected, the power of contagion would increase. It would proceed in a geometrical ratio, diverging from the centre, to every point of the circumference, of a city, a camp, an hospital, or a ship. It is evident then, that in these situations, a contagion, which had the power of producing its peculiar disease, in the same person, more than once during life, would never disappear. But dysentery, fevers, and the plague itself cease, in all



those situations, without having affected perhaps a tenth part of the community. They cease too when they are epidemic, according to some periodical law, which evinces that they do not arise from any casual and uncertain source, like the accidental application of contagious matter.

THE absurdity of the conclusions which result from admitting contagious matter to be the cause of epidemic and pestilential diseases could not have been overlooked till now, if the existence of such a source had not been so implicitly taken for granted, that even to call in question the truth of it, must, to many, have the appearance of successive scepticism. But I shall endeavour to deduce my conclusions, from such numerous and undoubted facts, as ought, perhaps, to exempt me from that imputation.

DURING the prevalence of epidemic and pestilential diseases, it is well known, that nurses, and other attendants upon the sick, are not more liable to be affected than other people, who undergo an equal degree of fatigue. It may perhaps, be said, that they become habituated to the contagion. But how do they escape the first application of it? They have not then got the habit. No person of that description caught the infection from those who died, of what was called the jail fever at the black assizes at Oxford; a



case of alledged contagion so generally known, and so frequently quoted by authors. That the power, which occasioned disease at the Oxford affizes, was not contagious matter, is proved by its producing diarrhœa in some, while it produced fevers in others. And further, no person was seized, who had not been directly exposed to the influence of the noxious air. Specific contagion, I conceive, cannot produce a disease less uniform in its appearance, than small-pox and meazles. But every epidemic and pestilential disease, which has hitherto been reputed contagious, assumes such various and dissimilar appearances, in different persons, that they cannot be the effect of any power, equal and uniform in its operation. The symptoms are not, in any two persons, exactly alike. Hence the difference of opinion among the physicians of Philadelphia, during their late epidemic; some asserting that every disease had resolved itself into yellow fever, while others, certainly with more reason, affirmed that the diseases of the city were various. No epidemic can become so general, as to suppress all other diseases; because all men, labouring under diseases of lower degree, are not exposed to the powers which produce an epidemic. The same person indeed cannot, at the same time,



have both a dysentery and a dropfy ;\* but every usual variety of disease may exist in a community, even in the time of a powerful epidemic, altho' the epidemic be the most general disorder. The dissimilarity of symptoms, which occasioned this difference of opinion at Philadelphia, is, to me, a convincing proof, were there not many others, that the yellow fever of that city, did not arise from any power, of such uniform operation, as contagious matter. Like wine, opium, or mercury, specific contagion must produce similar effects, upon all men, who are similarly situated. It must act alike in Egypt and in America, in London and in Constantinople. But, according to all accounts, the symptoms of epidemic diseases, in different parts of the world, are very dissimilar ; while those of diseases that are undoubtedly contagious, such as small-pox, measles, lues venerea, &c. are the same in all. Wine will intoxicate, cathartics will purge, mercury will salivate in all countries. They will produce these effects, upon almost all men ; certainly upon all men who are in health. Those only, who are in a state of disease, higher

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\* It is only meant, in as far as they are general diseases ; for, the local affections, which have obtained these names, as they occur in different parts of the body, may readily co-exist.



in degree than these powers can produce, will resist their operation.\* But this proportion cannot be one in a thousand, perhaps not one in ten thousand. Such also may be the proportion that would escape, from the effects of a specific contagion, applied to them. It is common, however, for men in health, to be exposed to contact with the sick, and to escape. In that case, contagion, if the disease had been contagious, must inevitably have been applied; and without producing its imputed effects.

Was not the typhus fever, by which so many of the unfortunate people, who were imprisoned in the black hole of Calcutta, perished, attended with an endless variety of symptoms? It does not appear that the disease was, in that case, communicated to any person, who had not breathed the polluted air of the dungeon. Will it be said, that the Nabob Surajeddoullah had previously ordered contagious matter to be inserted into the black hole? If not, whence was it imported, or where generated?

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\* It is impossible, with the greatest quantity of mercury that has ever been given, to salivate a person, whose liver is in a state of supuration. No quantity of wine will intoxicate a person, ill of typhus fever, without having first cured the disease.



IN the history of these diseases, I think it may be remarked, that physicians have been peculiarly exempted from their influence. Is it that there is a principle of repulsion between medical skill and contagion? or is it not rather for this plain reason, that these diseases depend upon some other power, which the physician is better able to avoid? For, will any reasonable person assert, that a medical practitioner (unless the structure of his body be supposed different from that of other people) can visit a patient ten or twelve times, feel his pulse, and converse with him, without receiving the infection, if the disease of the patient be contagious, and the practitioner has not, at the time, a disease of higher degree? Physicians, in perfect health, have attended as many patients, ill of diseases hitherto reputed contagious, as they could visit in the day; and yet have escaped. But it is as absurd to believe, that a person can be exposed to the influence of any power, capable of producing plague, dysentery, or fever, without being affected, as that a large quantity of spirituous liquors, or stimuli, still more diffusible, can be applied to living bodies, without producing a correspondent effect. If it be at all admitted, that contagion is the cause of these diseases; it must also be admitted, that contagion, as in this



case, may sometimes be applied, without producing its effect,—which is impossible.

ANOTHER fact worthy of notice is, that aged persons and children, are both seldomer and less severely attacked by epidemic and pestilential diseases, than the young and middle aged; and women seldomer and less severely than men. Now, if contagion was the source of these diseases, the case would be exactly reversed. Old people, women, and children, being more in the way of contagion, would be more frequently and more severely attacked. But the young and middle aged, being more exposed to the vicissitudes of the atmosphere,—the principal source, as I shall afterwards endeavour to shew, of those diseases, than aged persons and children, and men more than women, they are consequently more severely attacked. It has been a puzzling question to solve, “ why old people and children have been less obnoxious to plague, dysentery, and fevers, than the young and middle aged; and women less than men?” But the solution will no longer be difficult, if it should be proved that these diseases never arise from contagion, but are always produced by certain states or certain vicissitudes of the atmosphere, together with the application of other powers, co-operating in the production of indi-



rect debility. For, it is evident that, to the influence of these states, or vicissitudes, and of these powers, the young and middle aged are always more exposed than old people and children; and men more than women.

LET a person, in the height of a pestilential disease, be removed from the atmosphere which occasioned it, into one more pure, he will communicate the infection to no one. "It has been remarked," says Dr. Rush, speaking of the yellow fever of Philadelphia "that this fever did not spread in the country, when carried there by persons who were infected, and afterwards died with it." In another place he observes, "during four times that it occurred in Charleston, in no one instance, according to Dr. Lining, was it propagated in any other part of the state."\* Convincing proofs these, that the disease did not depend upon contagion, but upon the state of the atmosphere at Philadelphia in the one case, and at Charleston in the other. The various ways in which the College of Physicians of Philadelphia and Dr. Rush attempted to account for the origin of the contagion, which they supposed had produced the yellow fever of 1793.

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\* Vide an account of the bilious, remitting, yellow fever, of Philadelphia, by B. Rush, M. D. page 157.



shews into what inconsistencies the most sensible men may be betrayed, when they attempt to reason upon false data. Having all taken the *existence* of contagion for granted, they only differ with respect to the *origin* of it. The College was of opinion, that it was *imported*; Dr. Rush affirmed, that it was *generated* in the city. A better description cannot be given of the several hypotheses, which distracted the faculty, upon this occasion, than in his own words, “ public report  
“ had derived it” (the contagion) “ from several  
“ different Islands; had chased it from ship to  
“ ship, and from shore to shore; and finally conveyed it, at different times, in the city, alternately by dead and living bodies; and from  
“ these tales, all of which, when investigated,  
“ were proved to be without foundation, the college of physicians composed their letter.\* It  
“ would seem, from this conduct of the college, as if medical superstition had changed its  
“ names, and that in accounting for the origin  
“ of pestilential fevers, celestial, planetary,  
“ and demoniacal influence, had only yielded  
“ to the term—*importation*†.” But it does not appear that Dr. Rush, in his attempts to trace the origin of the contagion, was more successful

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\* Containing their opinion respecting the origin and treatment of the Yellow Fever. Vide Rush, page 21.

† Vide an Account of the Yellow Fever, page 164.



than the college. He supposed it to arise from putrid, vegetable exhalation, produced by a heap of damaged coffee, lying on a wharf. But the progress of the disease was not traced, with any certainty, to that focus. It is evident, indeed, from Dr. Rush's own account, that the inhabitants of other streets had been as early and as generally affected, as those of the streets in the immediate neighbourhood of the coffee.

IN this, and every other case of epidemic and pestilential disease, the existence of contagion would seem to have been uniformly taken for granted, not only without examination, but even contrary to the evidence of numerous facts—a conduct certainly not less unphilosophical in medicine, than in any other department of science.

3—CERTAIN states or vicissitudes of the atmosphere, together with the application of other powers, producing indirect debility, are the cause of all epidemic and pestilential diseases, which affect the same person more than once during life, and have hitherto been reputed contagious,

EVERY country has its unhealthy season, corresponding with some particular period of the year, at which the diseases, peculiar to that country, are more general and severe than at other times. This is observed to happen, in those months most remarkable for heat, calm weather,



or sudden vicissitudes of the atmosphere ; and they are nearly the same in all parts of the world. In Europe, Asia, Africa and America, from July to October, with little variation, includes the most unhealthy portion of the year. In some places indeed, as Aleppo, that happens from April to July ; but always with a certain regularity, coinciding with periodical states of the weather. The diseases which annually arise from this source, are not always general or severe. It is only when the heat, calm weather, or vicissitudes of the atmosphere, have been uncommon, that the ordinary diseases of the season arise to a degree, which constitutes epidemic and pestilential diseases.

FROM every record of epidemic and pestilential diseases, it would appear, that they have their stated periods of recurrence ; that these periods are such months, as are most remarkable for vicissitudes of the atmosphere ; that they become general, only in years in which these vicissitudes are extreme ; that they do not occur in seasons when the degrees of heat or cold, however intense, are equable ; nor in years when the state of the atmosphere remains tempered throughout ; and that they uniformly cease, with the establishment of an equable state of the atmosphere, whether the weather be hot or cold.



THE yellow fever in America “ appeared six  
“ different times about the 1st or middle of Au-  
“ gust, and declined or ceased about the mid-  
“ dle of October—viz. in 1732, 1739, 1745,  
“ and 1748 in Charleston; in 1791 in New  
“ York; and 1793 in Philadelphia.”\* In  
1793, the yellow fever appeared also in different  
parts of the West Indies.† Attempts were made,  
in the Islands, to trace the contagion to the con-  
tinent. On the continent it was traced back to  
the Islands. But why should we hesitate to be-  
lieve, that the same general causes which produc-  
ed unusual vicissitudes of the atmosphere, in the  
one country, should extend their influence to  
the other? In the same year, and the same sea-  
son, the English settlers, on the coast of Africa,  
were seized with a fever, which proved fatal to a  
great number of them. It happened, at this  
period, that a ship arrived from Boullam, on  
the coast of Africa, at Grenada, in the West  
Indies. And hence the contagion was supposed,  
by Dr. Chisholm and others, to have been im-  
ported in that ship. Was it necessary, it might  
easily be shewn, that these suppositions were  
adopted upon very slight grounds. But if the ex-  
istence of contagion can be disproved upon gene-

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\* Rush on the Yellow Fever.

† Vide Chisholm on the Malignant, Pestilential Fever, &c.



ral grounds, it would be superfluous to investigate every particular circumstance in its favour, that may have been hastily assumed as a fact.

IN Aleppo, according to Dr. Russell, the European inhabitants regularly shut themselves up, in their houses, every year, at some period between April and July. And the rich natives begin to adopt the same plan, as far as their customs will permit them to do, without scandal. From this fact, it appears that the plague occurs at Aleppo, in a state less or more mild, almost annually, and *that it commences and ceases at certain known periods*. But it has been remarked there that, in its most severe state, this disease recurs only at periods of ten years, or thereabouts—a regularity, which cannot, upon any known principle, be attributed to a power of such casual application, as contagious matter.

It has farther been observed of the plague, that “the winter puts an end to it at Constantinople; the summer destroys it in Egypt.” In fact, what epidemic or pestilential disease has been known to occur with severity at these periods of the year? But, in order to account for this, will it be said, that contagion is destroyed, both by heat and by cold? The assertion would certainly be absurd. Besides the fact can be much better explained. At these periods, the body is



not so liable to disease, because it is not exposed to the effects of heat and cold, dryness and moisture, tempestuous and calm weather, suddenly and frequently alternated. These vicissitudes are most remarkable in spring and autumn, which accordingly are the seasons, most fertile of diseases, in all parts of the globe. It is a curious circumstance, and much to our present purpose, that the belief of the Turks in the contagious nature of the plague, has considerably increased, since their communication with Europeans has become more extended. Formerly there was no want of servants, or relations, to undertake every necessary office about the sick, the same as in any common distemper; but now, it is difficult to procure even mercenary attendants. "I have met," says Dr. Russell, speaking of the plague at Aleppo in 1760, "with several instances, even in Turkish  
"houses, where the mistress of the family was  
"not only ill attended, but even abandoned  
"through the timidity of her daughters and  
"slaves. I apprehend the dread of contagion  
"gains ground among the Mahommedans, in  
"all parts of Syria, where the Europeans have  
"much commerce." Mahommed, having probably perceived the bad consequences that would result from such a dread, condemned the belief of diseases being spread by contagion, as *impious*. And this at least shews, that the plague has not



always been supposed, by the Turks, to arise from contagion ; or if it has, that the belief was deemed injurious. With the example of European credulity before them, the modern followers of Mahommed may, in no long time, put more faith in contagion, than in this law of their prophet. But in such a renunciation of faith, even a Christian will have little cause to rejoice. If it should appear to be only a substitution of one error for another, Europeans will not have much reason to ridicule the former stupidity of the Turks ; nor to boast of their own superior penetration, in introducing among them a belief in the contagious nature of pestilential diseases.

PHYSICIANS, having observed the dependence of epidemic diseases upon the state of the atmosphere, their uniform appearance under some states, and cessation under others, could not well reconcile these facts with the hypothesis of contagion. But a reconciliation was, at all events, determined upon. The state of the atmosphere was made to act upon the matter of contagion, in such a manner as to explain every phenomenon. Is the weather hot, when an epidemic commences, heat gives activity to contagion ; is it cold, cold is favourable to contagion ; is it dry, the contagion is concentrated ; is it wet, diluted : even vicissitudes set it in motion. But should the epidemic



happen to cease, during any of these states of the atmosphere, this may with equal facility be accounted for, by assigning to the *same* powers, as has frequently been done in medical reasoning, *different* or even *opposite* modes of operation. Let the existence of contagion be once admitted as a fact, and there is nothing more easy than to trace its origin to some ideal source. The most obvious, and therefore the most frequently insisted upon, is contact with some person, ill of the same disease. But as the person, who happens to be first seized, could not have received the infection in that manner, it was found necessary to refer it to various sources. Even with those advantages, however, it was often difficult, and exercised the ingenuity of the learned, to discover the origin of particular epidemics. The imputed sources of those calamities became at length so numerous, that it requires little labour to trace the origin of all diseases to some one, or other of them. If, for instance, it cannot be traced to actual contact, it will probably be discovered, that the patient has, at some recent period, been exposed to the effluvia of rotten hemp, flax, coffee, cabbage, onions, black pepper, or potatoes; for all of these powers have been said to produce epidemics. But in years, when these diseases are so highly pesti-



lential, that the effluvia, arising from a heap of rotten vegetables, might seem too trifling a power to produce such important effects, recourse may still be had to the importation of contagious matter, in bales of goods from the Mediterranean ; or, with the ingenious Gibbon, to the generation of it, by swarms of putrid locusts, in Egypt. These hypotheses, were they not supported by the authority of celebrated names, are almost too ridiculous for refutation. That a parcel of rotten vegetables should produce a disease, that is contagious, and capable of producing desolation and death, over a populous city, ought not certainly to be credited without proof ; and with respect to proof, it does not appear that there is any, excepting that, during the prevalence of epidemics, vegetables have become putrid. Was putrid vegetable exhalation ever the cause of a contagious disease, it would spread in an evident and regular progression, affecting first those who are nearest to its source. There could be no possibility of mistaking or overlooking the cause. But as no such progress has ever been ascertained, and as it might have easily been traced, had there been any truth in the opinion, it is every way inconsistent with just reasoning to admit, that putrid vegetable exhalation can be the cause of contagion.—I mean not to deny, that putrid vegetable exhalation may produce disease, but the disease



will be contagious. There cannot be a doubt that putrid vegetable exhalation is a power, capable of producing disease, in its immediate neighbourhood ; but it is equally certain, that it never can occasion an epidemic or pestilential disease, over a whole country, or city. The putridity of vegetables, and the epidemic diseases of animals, are probably occasioned by the same power, viz. a certain state or certain vicissitudes of the atmosphere. That kind of weather or that disposition of the surrounding elements, which occasions an uncommon mortality among animals and vegetables, will also produce an uncommon degree of putrefaction, among these substances, their dead state.

COULD the history of all epidemic and pestilential diseases of animals be minutely traced, I am well convinced it would be found that they have uniformly been attended with correspondent diseases of vegetables, in that particular part of a country, to which they have been confined. For, as all living bodies are subject to the same laws,\* it is evident that any power, which can produce general disease in animals, will have the same effect upon that portion of vegetable substances to which it is applied ; and *vice versa*. Accordingly those diseases of indirect debility of vegetables,

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\* Vide prop. I. View of the Science of Life.



known to farmers by the terms *rust* and *blast*, have often been observed to occur, at the same time with epidemic diseases among animals. And the reason why such a coincidence has not always been expressly noticed, is probably, that the subject has not been considered in this point of view. If such a coincidence then should be found invariably true, will it be said that contagion may be communicated from animals to vegetables, and from vegetables to animals?

WHEN particular districts of a country, whole nations, or considerable portions of a continent, are suffering from a scarcity of grain, will it be said that the disease of vegetables, which is the cause of the scarcity, was produced, not by the state of the atmosphere, but by contagion? In this case, how is the contagious matter to be traced? Is it wafted, as it were by a magic influence, from field to field,—over mountains, rivers, lakes, and oceans? The infectious distance would, in that case, be wide indeed! But I apprehend it will scarcely be contended, that the epidemic diseases of vegetables are contagious. And in regard to animals, the opinion does not appear at all more probable; excepting from the single circumstance of their not being rooted to the soil. Would it not be more rational to admit, that the diseases, in both cases, as produced by the operation of some such general power as the states or vicissi-



tudes of the atmosphere, to the influence of which animals and vegetables are equally exposed?

OF the numerous facts, by which this proposition is supported, it will suffice to quote a few. As Dr. Rush's account of the yellow fever of Philadelphia is, perhaps, the best history that has been given of any epidemic, it may be often with propriety referred to. There was something in the "heat and drought of the summer months," (1793) "which was uncommon, in their influence upon the human body. Labourers everywhere gave out, (to use the common phrase) in harvest, and frequently too when the mercury in Fahrenheit's Thermometer was under 84\*\*\*. The crops of grain and grass were impaired by the droughts."

It appears, from several observations, that there was, that year, an uncommon calmness of the weather.

"In the year 1762, the billious yellow fever prevailed in Philadelphia, after a very hot summer, and spread like a plague, carrying off daily, for some time, upwards of twenty persons." Can it be doubted, that these states of the weather will produce disease, both among animals and vegetables? And if the operation of such an obvious power, be adequate to explain the phænomen-



na of pestilential diseases, what need is there of adopting an ideal one, like contagious matter, to account for them?

MR. Potter, in a letter to Dr. Rush, dated from Caroline, county Maryland, 1st November, 1793, says, "it is an invariable maxim here, both among  
" physicians and farmers, that, if the wheat be  
" damaged by rust or blast, a contagious dysen-  
" tery is soon to follow."\*

PREVIOUS to the occurrence of every epidemic, something unusual, in the state of the atmosphere, has always been remarked. A yellow fever appeared at Cadiz, after a hot and dry summer in 1764; and at Pensacola, in similar circumstances, in 1765. Was the contagion traced, in this case, from Cadiz to Pensacola, by a direct or circuitous channel, or was it traced at all?—That the yellow fever of Philadelphia, in 1793, depended upon the states or vicissitudes of the atmosphere, evidently appears from the following observations, communicated to Dr. Rush, by a gentleman, who resided occasionally in southern and tropical countries. He informed him, that he had observed, in  
" the month of July, several weeks before the  
" yellow fever became general, a peculiar and

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\* Page 181.



“ universal fallowness of complexion, in the faces  
“ of the citizens of Philadelphia, such as he had  
“ observed to precede the prevalence of malignant  
“ bilious fevers, in hot climates.” Dr. Dick had  
“ observed the same appearance in the faces of  
“ people in Alexandria, accompanied in some ca-  
“ ses, by a yellowness in the eyes, during the last  
“ summer,” (1793) “and some time before vio-  
“ lent, bilious fevers became epidemic, upon the  
“ banks of the Potowmac.”\* A change so gradu-  
al and general in the appearance, both of animals  
and vegetables, can never be explained by admit-  
ting contagion, but is easily and satisfactorily ac-  
counted for, by supposing the states or vicissitudes  
of the atmosphere to have been the noxious pow-  
er. “ It appears farther, from the register of the  
“ weather, that there was no rain between the  
“ 25th of August, and the 15th of October, ex-  
“ cept a few drops, hardly enough to lay the dust  
“ of the streets, on the 9th of September, and the  
“ 12th of October. In consequence of this  
“ drought, the springs and wells failed in many  
“ parts of the country. The dust, in some places,  
“ extended two feet above the surface of the  
“ ground. The pastures were deficient or burnt  
“ up. There was a scarcity of autumnal fruits in  
“ the neighbourhood of the city. But while veg-

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\* Vide Rush, page 183.



“ etation drooped or died from the want of mois-  
“ ture in some places, it revived with preterna-  
“ tural vigour, from unusual heat, in others.  
“ Cherry trees blossomed, and apple, pear, and  
“ plumb trees bore young fruit, in several gar-  
“ dens in Trenton, thirty miles from Philadel-  
“ phia, in the month of October.

“ HOWEVER unoffensive uniform heat, when  
“ agitated by gentle breezes, may be; there is,  
“ I believe, no record of a dry, warm, and stag-  
“ nating air, having existed for any length of  
“ time, without producing diseases. Hippocrates  
“ in describing a pestilential fever, says, the year  
“ in which it prevailed, was without a breeze of  
“ wind. The same state of the atmosphere, for  
six weeks, is mentioned in many of the histories  
of the plague, which prevailed in London, in  
1665.”\*

THUS all the facts stated by Dr. Rush, and many of his observations prove, that the yellow fever of Philadelphia, in common with other epidemics, was produced by the states or vicissitudes of the atmosphere, and not by contagious matter, imported, or generated in the city.

PESTILENTIAL diseases are neither so frequent nor so fatal in modern, as they were in ancient

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\* See Rush, pages 109—110.



times. Cities are now more commodiously built; the mode of living is improved; and every circumstance that can contribute to the preservation of health better understood. Is it not from these changes, in the state of society, that London, Paris, Madrid, Lisbon, and Marseilles are now much less subject to epidemic diseases than formerly? And in the progress of improvement, may not these diseases entirely disappear? The inhabitants of Grand Cairo, according to Mr. Savary, are heaped together by thousands. Two hundred citizens there occupy less space than thirty at Paris. Thirty citizens at Paris occupy less space than ten citizens of London. Twenty citizens of Grand Cairo, therefore occupy less space than one citizen of London. The manner in which the citizens of Grand Cairo are thus crowded together, would alone seem sufficient, in a stagnant state of the atmosphere, to produce pestilential diseases of the highest degree.

THE large commercial cities, which have been most frequently ravaged by the plague, are for the convenience of sea ports, built in low and unhealthy situations. Their streets have generally been irregular, crowded, and dirty. In these cities, therefore, pestilential diseases always commence. This circumstance, together with that effect of self-love, which prevents us from discovering the origin of any evil with ourselves, pro-



bably gave rise to the idea, that contagion was imported in bales of goods, or even in parcels of old clothes, from distant countries. The Epidemic of a season, appearing generally in several places at a time, by enabling the inhabitants of one place to trace it to another, has also served to strengthen the same opinion. But may not similar states of the atmosphere occur in the same season, in Egypt and in Syria, in Damascus and in Aleppo, in Grand Cairo and in Marseilles, in Smyrna and in London, in the West India Islands and in America? And will not these similar states produce pestilential diseases of a similar appearance? The plague, indeed, will never appear with similar symptoms in London and in Constantinople, because the states or vicissitudes of the atmosphere, in these two places, can never be exactly alike. But if it depended upon a power, like specific contagion, which must be the same in all places, the symptoms would everywhere appear with a uniformity similar to those of small-pox.

CONTAGION then, it would seem, cannot explain the phenomena of pestilential diseases, without the assistance of the states or vicissitudes of the atmosphere; but the states or vicissitudes of the atmosphere will explain them, without the assistance of contagion. Here I will again avail myself of the authority of Dr. Rush, as far as importation is concerned. "The report of



“ the College of Physicians has served to con-  
“ firm me in an opinion, that the plagues which  
“ desolated most of the countries in Europe in  
“ former centuries, and which were always said  
“ to be foreign extraction, were in most instan-  
“ ces of domestic origin. Between the years  
“ 1006 and 1680, the plague was epidemic 52  
“ times all over Europe. It prevailed 14 times  
“ in the 14th century. The state of Europe in  
“ this long period is well known. Idleness, a  
“ deficiency of vegetable aliment, a camp life  
“ from the frequency of wars, famine, an un-  
“ cultivated and marshy soil, small cabins, and  
“ the want of cleanliness in dress, diet, and  
“ furniture, all concurred to generate pestilenti-  
“ al diseases. The plagues which prevailed in  
“ London every year, from 1593 to 1611, and  
“ from 1636 to 1649, I suspect were generated  
“ in that city. The diminution of plagues in  
“ Europe, more especially in London, appears  
“ to have been produced by the great change in  
“ the diet and manners of the people; also by the  
“ more commodious and airy forms of the houses  
“ of the poor, among whom the plague *always*  
“ makes its first appearance. It is true these  
“ plagues were said by authors to have been im-  
“ ported, either directly or indirectly from the  
“ Levant; but the proofs of such importation  
“ were in most cases as vague and deficient as  
“ they were of the West-India origin of our late



“ epidemic. The pestilential fevers, which have  
“ been mentioned, have been described by au-  
“ thors, by the generic name of the plague.”\*

WHY do pestilential diseases *always* make their first appearance among the poor? Has contagious matter an instinctive attachment to this class of men? No. But they are constantly more exposed than the rich, to the principal power, which produces pestilential diseases, viz. certain states or certain vicissitudes of the weather.

THE vicissitudes of the atmosphere constitute a power great, evident, and extensive, in its effects upon the animal and vegetable world:—a source, to which the epidemic and pestilential diseases of living bodies may, with certainty, be traced. Whereas contagious matter is a power that has uniformly been taken for granted, without examination; of which the existence, in epidemic and pestilential diseases, is even disproved by a numerous induction of facts; and, if admitted, is incapable of explaining their phenomena.

FROM all these considerations, I conclude that no general disease, excepting such as occur only once during life, is contagious. And that all epidemic and pestilential diseases, which occur more than once during life, and have hitherto



been reputed contagious, depend upon certain states, or certain vicissitudes of the atmosphere, together with the application of other powers, producing indirect debility.

VIEWING this as not merely a question of idle medical disputation, but as one of the utmost practical importance, I regret that neither my abilities nor my situation, enable me to do it that justice, which it certainly deserves. The attempt, which I have made, may however, be the means of calling forth the observations of others, better qualified to illustrate the subject. Whether the existence of contagion, in epidemic and pestilential diseases, be ultimately proved, or disproved, a discussion, and decision of the question must be attended with considerable utility. Let us take a view of the pernicious consequences which result from the opinion now received, supposing it to be false; and contrast it with the benefits that would arise from a contrary one, supposing it to be true.

THE consternation and mortality, occasioned by epidemic diseases, must always be greatly increased, by a belief in their contagious nature. Those who are yet well, will be the more readily affected; and those who are ill, will be in greater danger of suffering, from the desertion of timid relations, or mercenary attendants. What serious evils may not the dread of contagion



produce, among the uninformed multitude, when it can occasion such scenes as the following, among sensible men of the medical profession? In 1665, we find Dr. Hodges prescribing, from his parlor window, for patients in the streets of London; and at a later period, Dr. P. Russell prescribing from a chamber window, fifteen feet above the level of the streets at Aleppo. Dr. A. Russell's candid account of the manner in which he prescribed, is worthy of note; both as it tends to disprove contagion, and to shew the pernicious consequences of believing in it. "In the two preceding years" (he wrote in 1744) "I had prescribed for the sick, chiefly from the accounts brought me by a person, whom I employed to visit them; for though before shutting up, I was often, in spite of all my precautions, deceived by false representations of the case, and led to visit some of the infected; yet I avoided it to the utmost of my power: but this year the dread of contagion (like that of other dangers to which one has been long exposed) being much worn off, I attended the sick in the plague in the same manner as those labouring under ordinary fevers." Could Dr. Russell, or his deputy, have attended the sick, with impunity, if the disease had been contagious? In other words, can a power be applied, without producing its correspondent effect? I



know not by what refinement of sophistry the force of this objection can be alluded. To come down to a period still more recent, some of the physicians of Philadelphia are said to have fled the city, during the prevalence of their late epidemic ; a conduct that must have added both to the consternation and mortality of their patients. The effects of a popular belief in such opinions are, in my estimation, no less injurious to mankind, than they are humiliating to the medical profession. What would be said of a military officer, who deserted his post at the sight of an enemy, leaving his fellow-soldiers to fight the battle ? During the rage of an epidemic, physicians may be looked upon as general officers, in whom it is always regarded more shameful to abandon the field of battle, than in private soldiers.

If on the other hand, a belief in contagion was entirely laid aside, the European inhabitants of Aleppo, and other places subject to the plague, would no longer shut themselves up in their houses, for fear of contagion. They would only remain at home occasionally, to avoid the influence of the sun, or vicissitudes of the weather. Instead of a constant confinement for several months, they would only think it necessary to refrain from going abroad during the hottest part of the day ; or to take precautions against the morning and



evening fogs. Thus the dread inspired by the apprehensions of infection, would happily be banished from their minds; and that alone would be a powerful mean of protecting them from disease. It is not supposed, however, that the custom of shutting up is useless. The utility of it is evident; and it is as evidently founded upon a principle very different from that of avoiding contagion. By confinement, the inhabitants of Aleppo avoid exposure to heat, and the vicissitudes of the weather, which are the real source of the plague. But their confinement, if regulated upon principle, need neither be so constant nor so anxious.

ANOTHER advantage that would result from rejecting the doctrine of contagion, in pestilential diseases, is that the quarantines usually exacted of ships, coming from places suspected of contagion, would no longer be considered necessary. The hardship, or rather the cruelty of such ordeals, is too evident to require a comment. Could the contagion be conveyed in the manner supposed, the injury to individuals must of course be suffered, on account of the community. But if it be proved that this cannot happen, the restriction must appear exceedingly absurd. Is it probable, that London being exempted from pestilential diseases, for many years past, will be imputed to the wonderful strictness, with which Mediterranean



ships have been made to perform this forty days farce?

ABOVE all, the adoption of this theory, by recalling physicians from a wrong tract of investigation, would probably be the means of enabling them to apply principles to the cure of all epidemic diseases, hitherto so often fatal, which would render them little more dangerous, than common fevers are at this day.—Instead of wasting time in tracing contagious matter from city to city, they would endeavour to discover what are the particular states or vicissitudes of the atmosphere, which produce epidemic diseases; what are the causes of these vicissitudes; and what are the best modes of counteracting their effects upon the human body.

THIS subject is highly worthy of investigation. For though it may be said that, as the stimulant powers, which are found to cure epidemic diseases, afford a proof that they depend upon a very great degree of indirect debility, and that therefore a minute acquaintance with the powers which occasioned them is not necessary to guide the practice; yet it must also be admitted, that every link, in the chain of knowledge, is a valuable acquisition.—There is not a fact in nature, from which some useful inference may not be drawn.



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### OBSERVATIONS ON THE CURE.

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WHATEVER be the powers that produce epidemic diseases, it is evident, from those which are found to cure them, that they all depend upon a high state of indirect debility. Fevers and dysentery have of late, every where, yielded to the powers of mercury, and other stimuli of the most diffusible kind. That is, those medicines have been found more successful, than any that were ever used before. If eight grains of calomel, and four grains of opium, repeated every two, three, or four hours, will cure a fever, or a dysentery of a certain degree, will not the same medicines produce the same effect in plague, if given in quantities proportionate to the force of the disease? Ought not the physicians of Aleppo to give a fair trial to a medicine in plague, which has been found so successful in other epidemics? As plague, however, is a disease, by all accounts, of a very high degree of exhaustion, it may sometimes be necessary to go the length of, from fifteen to twenty grains of calomel, or even more, in repeated doses. The duration of the action of each dose, should regulate their repetition; but that does not seem



to be yet accurately ascertained. It appears, as far as I have been able to observe, that the intervals, between the doses of mercury, ought not to be longer than two or three hours.—In exhibiting this medicine, it is a fact worthy of remark, and deserves to be particularly remembered when large doses are required, that by a sudden subduction of it, the patient is apt to have a very sore mouth, a violent salivation, and sometimes an alarming discharge of blood from the fauces. When any of these symptoms unexpectedly occur, it will be found, that the patient has suddenly left off his medicine, or has taken it in such an irregular manner, as to produce similar effects. This will often happen, from the imprudence of patients, in the hands of the most skilful physicians ; but it perhaps more frequently occurs, from an ignorance of the fact. Although it has already been noticed in my “ Treatise on the Action of Mercury,” yet it appears proper to insist upon it, in a more particular manner, when that medicine is proposed to be given in a disease, that will probably require its exhibition in unprecedented quantities. Suppose a case of plague to require the exhibition of a scruple of calomel every two or three hours, if it was suddenly left off, an alarming hemorrhagy would in most cases ensue. It would be of considerable advantage to the practitioner, to know that this effect was produced



by the too sudden subduction of the high stimulant power, which had been for some time previously applied to the body ; and that it may be prevented by the regular exhibition and gradual reduction ; or removed by the re-application of the same power, or the substitution of others equivalent in force. Vicissitudes in the application of substances, used in medicine, will produce disease, as well as vicissitudes in the state of the atmosphere, or in the force of any other exciting power. But an application of the same powers, in a due degree, will remove the diseases which an excessive or deficient application, or alterations in the force of them may have occasioned.

THE terms excess and deficiency, in the application of external powers to living bodies, do not relate to the sum of stimulus usually applied in a state of health, but to the state of the excitability at the time.



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