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*On the Use of Alkalis and Absorbents in Disorders of the
Stomach and Bowels.*

THIS season of the year is generally productive of complaints in the first passages: But where the summer has been unusually hot, and fruit plenty, these disorders are observed to be more frequent, more severe, and more obstinate. Most of our readers, we conclude, have already observed the effects of the last summer, in the production of Cholera and Diarrhœa; and when the cold weather sets in, they will probably become more frequent.

As there are two methods of treating these complaints, almost diametrically opposite to each other, and as our experience has not been inconsiderable, we shall take this occasion of making a few observations on the subject, and subjoining others which have been made in America.

When a patient is suddenly attacked with vomiting or purging, or both, and these are attended with severe pains in the stomach and bowels, cold extremities, and general spasms; the regular mode of treatment is to get down warm water, chamomile tea, broths, weak brandy and water, &c. in considerable quantity, to dilute the acrid bile. As soon as the patient becomes tolerably easy, or obtains some respite from his misery, small doses of rhubarb are given in mint water, with nutmeg water, or some aromatic confection; and to these are often added paregoric elixir, laudanum, or chalk. This mode of treatment will generally succeed, and it appears as rational as it is regular; for, say its abettors, how can we cure a disease while the cause of it is within? This idea however of evacuating the offending bile, when it gets possession of young practitioners, very often leads them to the use of antimonial emetics and drastic purgatives, which we think highly improper and often dangerous.

Having often had occasion to see cases which had been left to the efforts of Nature, or treated with evacuants for several days, prove very obstinate, and sometimes degenerate into Dysenteries, we were induced to view this disease in a different light.

The general tendency to spasm observed in it, the ill effects of acids, and, on the contrary, the good effects of absorbents and aromatics, so constantly observed, even in primo morbi insultu, induced us to try a plan of treatment the reverse of the regular one. Instead of evacuating the bile, we gave small doses of opium and chalk with aromatics, every hour, till the patient became easy.

When the irritation and spasmodic symptoms are subdued, which this plan never fails to effect in a few hours, if the extremities are kept warm, we have recourse to proper clysters to evacuate the bowels. If the patient continues free from any return of the attack for twelve or twenty hours, we give a moderate dose of rhubarb and magnesia with fifteen grains of soda, and repeat it if necessary on the morrow.

In reading the Medical Transactions of America, we found that Dr. Mitchill's theory of septon or azotic acid being the cause of several epidemic diseases, had led practitioners on that continent to treat Autumnal Diarrhœas on a similar principle. Dr. Daniel, in a letter to Dr. Mitchill, dated March 29, 1802, says, "I have lately put to the test of practice your theory respecting morbid affections produced by septic acid generated in the intestinal canal. As the result has been highly satisfactory, I take the liberty, though a stranger, of addressing you upon the subject.

"I think it necessary to premise, that, during the last summer and autumn, the inhabitants of this place, and of the country for some distance around, were nearly exempt from the usual intermitting and remitting fevers of those seasons; and this exemption extended even to those living near marshes and water courses. The only disease which engaged much of my attention was a diarrhœa of a singular kind, and that was so general that I believe there were few persons who did not suffer more or less from it during the time of its prevalence.—I shall not trouble you with a minute description of this complaint, but mention some of its most remarkable symptoms as sufficient for my present purpose. The most uniform and characteristic feature was a very white, chalky appearance of the fæces; for in not one single instance did I observe the slightest tinge of bile, but, on the contrary, a total absence of that fluid. The dejections, though frequent, were not very liquid; and my patients complained, in passing them, of a hot, smarting sensation at the end of the rectum. The febrile symptoms were seldom high, and in some cases entirely absent, though the pulse generally was stronger than would have been expected, considering the degree of languor and depression of strength which usually attended. In some instances, where the appetite became very much impaired, and the stools very frequent, they were mixed with mu-

cus and blood; but this was not a common occurrence. I think it remarkable that most of the affected persons complained of uneasy sensations in the region of the liver; but none of their skins discovered a bilious tinge.

" This disease was in very few instances fatal, but extremely obstinate and distressing. It did not end with the autumn, like the complaints of that season, but continued to show itself till the end of January; since when I have not heard of it. I was myself amongst the first attacked by it; and, in addition to the symptoms mentioned above, was troubled with frequent eructations of air, which diffused a very hot, keen, and disagreeable sensation upon the fauces and mouth; but differing from what is usually called heartburn.

" My first curative attempts upon this epidemic were very unsatisfactory indeed. I tried the whole list of remedies usually given in similar affections; such as emetics, cathartics, anodynes, bitters, and astringents; but all to little purpose, the symptoms generally returning as soon as the action of the medicines was over.

" My chagrin at being so often baffled in my attempts to cure a disease attended with no very formidable symptoms, excited a closer investigation of its nature; and happening to turn my attention to your letter to Dr. Percival, of Manchester, published in the first volume of the Medical Repository, my perplexity respecting its exciting cause and treatment vanished. Your reasoning proved fully to my mind, that, from the nature of its usual contents, there must be a constant disposition to the evolution of septic acid in the alimentary canal whenever the digestive powers are impaired; that nature has, in her bounty, given us a corrective of this process in the alkaline quality of the bile; but whenever this corrective is wanting, the production of that acid must, of course, be the consequence. This doctrine was certainly a happy one, when applied to the disease of which I have been speaking. My earliest observations upon the symptoms convinced me that there was a torpor in the secreting powers of the liver, and a consequent deficiency of bile; but this led me no further than to the use of bitters, &c. as substitutes for that fluid. It was reserved for you, Sir, to point out the necessity of saturating the acid poison which aggravated the symptoms and protracted the cure. As soon as this necessity was impressed upon my mind, my difficulties were at an end; for, except giving calomel occasionally, with a view of rousing the liver, I had nothing more to do than to give, during the day, frequent doses of carbonate of potash dissolved in chamomile tea, and an anodyne at night. In

delicate stomachs the alkali was joined with citric acid. Under this treatment the disease not only lost its obstinacy, but became a mere trifle; and I think my acknowledgments due to you for the relief which my feelings experienced on the occasion.

"Before I close this letter, I must beg leave to draw your attention to a fact which has come under my observation: It is the singular effect which opium had upon two gentlemen of my acquaintance. They are brothers, and their habits nearly the same. They have both informed me that opium, as is usual, suspends the action of their intestines for some time (never less than twenty-four hours), and then they are seized with a brisk diarrhœa, which continues from four to six hours. The fæces discharged at that time are quite white, or, to use their own words, "they resembled thickened milk, except being rather more liquid." But the most remarkable circumstance is, that the discharges are of so active a quality as to excite the most insufferable pain, and completely excoriate the anus. One of them said, "he did not think *aqua-fortis* would hurt him worse," and the pain had often been so great as to bring out a clammy sweat upon his skin and induce faintness.

"In attempting an explanation of this phenomenon, I have supposed the opium to possess, in those two persons, a specific power of suspending, for a time, not only digestion, but also the secretion and transmission of bile to the stomach and intestines; that, during this suspension, a considerable accumulation of septic acid takes place, and excites a commotion in the intestines, which does not cease until they are emptied; or, the liver shakes off its torpor, and throws in the necessary quantity of bile to correct the acid.

"To put this reasoning, in some measure, to the test of experiment, I prevailed upon one of the gentlemen to submit to the effects of a dose of opium under my directions. Early in the evening, I gave him a dose of a solution of sal absinthii, and at bed time I gave him another, with a grain of pure opium. He repeated the doses of the solution several times during the fore part of the ensuing day, and in the afternoon it stimulated his bowels to gentle action. The stools were not quite so white as they had formerly been after taking opium, and entirely destitute of their sharp, corroding quality.

"I think it would be superfluous to offer any opinion upon this experiment, as the result appears to me to speak plainly for itself.

"I believed the above facts to be corroborative of your theory, and have therefore troubled you with them, and I should feel honoured in hearing that you concurred in that belief."

Facts concerning the Efficacy of Alkalis in Diseases of the Alimentary Canal. Communicated in a Letter from Mr. JOSEPH BRINGHURST, jun. to Dr. MILLER.

IN glancing over a page of the last number of the Medical Repository, my attention was arrested by an account of accidental cures of the disease termed Bilious Colic, by means of oils and alkalis. I can furnish additional evidence of the benefit of alkalis in that disease, and in those which arise from the same cause.

In the year 1793, I was grievously afflicted by dyspepsia, and frequently attacked by violent colic. As I was particularly attentive to my diet, I informed my physician, that I had observed those attacks of colic often followed an acid taste in my mouth, and were uniformly produced from my eating the smallest portion of pickle. These circumstances led him to a successful mode of practice in my disease. He combined one drachm of pure pot-ash with four ounces of water and a few drops of peppermint oil. Of this solution he directed me to take a tea-spoon full every ten minutes, until I obtained relief. I complied with his direction, and always found ease in a few minutes after I had taken the alkali. A friend, who laboured under dyspepsia, informed me that he always found bread containing pot-ash more suitable than any other for his stomach.

I should premise that I am an Apothecary, and consequently all my practice has been among poor people, who could not afford to pay a physician. A poor woman, during several weeks, laboured under a fever and ague. She became so much enfeebled that she could scarcely walk. Her aspect was cadaverous. She complained of great weight about her heart, and a sense of suffocation. Peruvian bark irritated her stomach. I suspected a vitiation of the fluids of her stomach, and conjectured that acidity was the chief cause of her sensations. One quarter of an ounce of magnesia, taken daily for three days, relieved her from the weight and sense of suffocation, and then bark completed her cure. In fever and ague I always combine the alkali, vulgarly called sal. tart. with bark. One ounce of bark, and half a drachm of the alkali, frequently cure persons in two or three days.

About six weeks since, a man of this borough sent his wife with a request that I would call to see him. I complied with his desire, and found him very ill. He informed me that he had sent for me with the hope of receiving benefit from my advice. I observed, in reply, that I was not a physician, and as he was very ill, his disease required a person of more skill

than myself. He urged me to prescribe for him—in truth, he almost compelled me to do so. He informed me that he had been ill for several months, and that, during the six last weeks, he had been wearing away with a violent flux. Large quantities of blood came from him two or three times daily, and he was obliged to use the close-stool from ten to forty times during each twenty-four hours. His evacuations of blood were always preceded by intense and cutting pains in his abdomen, and sensations which impressed him with fears of his hip bones-tearing asunder. From the colour and fœtor of his evacuations, and the cutting sensations of which he complained, I suspected a daily generation of acid in his stomach and intestines, and therefore resolved to administer alkalies. I immediately combined two ounces of pure soda with thirty-two grains of ipecacuanha. I divided the whole into sixteen doses, and ordered the patient to take three daily. I combined the ipecacuanha with the hope that it would float on the fluids of his stomach; and after the soda had united with the acid of his stomach, and formed a purgative salt, the powder would follow it, and operate as a tonic on his stomach and intestines.—The man is now in perfect health. When he had taken one ounce of the soda thus combined, his stools were diminished in number, quantity and appearance. They began to assume a natural colour, and were free from blood. In ten days he was able to walk about, and in less than three weeks he thought himself well. I charged him to eat simple food, and avoid such meats as would oppress his stomach. He foolishly transgressed, by eating sausages fried in lard, and brought on his pains and bloody stools. Three doses of soda relieved him; and, by care in his diet, he is now in perfect health.

To Dr. B A T T Y.

DEAR SIR,

IN your next Number I shall trouble you with two cases of Uterine Cancers successfully treated; in the mean time, your insertion of the following letter on a subject of the first importance in Medicine, and which shall be continued at some length in the future Numbers of your useful publication, will allow the opinions I entertain of it to be very generally known to the Gentlemen of the Profession, will enable them to correct mistakes

mistakes in my views of it, and to bring the principles of treatment, held out to the test of experience, by means of their own practice.

I am, &c.

*London Street, Fitzroy Square,
Sept. 23, 1802.*

W. NISBET.

LETTER TO SIR W. FARQUHAR, BART. ON THE PRINCIPLES TO BE ADOPTED IN THE TREATMENT OF CANCEROUS DISEASES.

SIR,

WHEN I had last the pleasure of seeing you, from the particular line of practice I had adopted, our conversation was naturally directed to the subject of Cancer. You then told me, with a frankness of character to which I gave every credit, that you did not believe a Cancer could be cured; and I, with equal candour, replied,—I did not wish you to believe any thing of which you had not complete evidence. It is from this assertion, on my part, and to support the opinion I then, and have uniformly delivered, that I now address you in the present observations, which I flatter myself will be found to meet approbation, and to open a new field of practice in this disease. I address them more especially to you, as having so strongly declared your scepticism on the subject, and also from your rank in Medicine, as you stand in that prominent situation which must influence the opinion of inferior practitioners.

In a late publication on the two diseases of Scrofula and Cancer, I took a retrospective view of what had been done by authors previous to the present period, in order to elucidate their nature and treatment, without detailing any particular opinions of my own,

In an Appendix to a second edition of that work, containing a letter addressed to Professor Gregory, in consequence of some correspondence on the subject with which you were acquainted, I entered into some detail of my own views on these diseases; and it is my design to unfold more at large what increased experience, a detection of error, and more enlarged observations, have confirmed.

The three great discoveries which have materially influenced the practice of Physic, in modern times, are, the discovery of the Circulation of the Blood, the discovery of the Lymphatic System, and the Uses of Respiration. The first of these has been sufficiently appreciated by most writers, and the knowledge of it applied, with much success, to the treatment of acute diseases. The second of these is daily gaining

gaining more importance, and the application of it is making, with much advantage, to the cure of most chronic affections. Both these discoveries, however, may be considered as imperfect, till the function of Respiration was chemically examined, and the changes induced by it on the animal system detected.

In order to be fully satisfied of this important truth, it will be necessary, as a preliminary step; first, to take some view of this discovery; secondly, to consider its influence on the Glandular or Lymphatic System in particular; and having done this, lastly, to apply the facts deduced from this foundation to the explanation and treatment of the present disease.

The extent of the changes induced by Respiration are, first, to convey to the blood, and of course, in a secondary way, to the solids, that principle which is the base of vitality, and which, under the name of Oxygen, is found essential to the support of life. It is conveyed in a constant and regular manner by a principal organ, appropriated to this particular purpose, and the quantity of it taken into the system by every inspiration of this organ, is equal to a hundred and twelve cubic inches in the minute. For we find, that the lungs inspire in this period sixteen times, and at each inspiration they carry in thirty cubic inches of atmospheric air, while the proportion of vital air being only a fourth of this, the quantity we have stated will be found correct. Of this quantity also, one half is immediately discharged by the same action of the lungs, in combination with two other principles, known under the name of Carbon and Hydrogen, extricated from the body. The two first consequences of the introduction of this principle into the system, is every part receiving increased animation and action, which often takes place to such a degree as to induce, from its excess, peculiar modifications of disease. Along with this increase of animation, an increase of temperature also ensues, and the animal heat we find communicated in proportion to the distribution of Oxygen through the body, or the frequency of inspiration in the different classes of animals; which introducing, of course, a greater quantity of this matter, occasions the various processes of chemical combination between the solids and fluids to be oftener repeated; processes, the great source of the extrication of heat. The third effect of the introduction of this principle into the system, and one materially connected with our views of the present disease, is the giving to the fluid that perfect state which renders it fit for the renewal of the different solid parts of the system, and for repairing that waste in their structure which necessarily accompanies the exercise of their functions, and occasionally is a consequence of their injury from external violence or other causes. This state constitutes the
formation

formation of what is termed Fibrina, the constituent part of all the solids of the body; a part which neither exists in the chyle nor lymph till the effects of respiration are communicated to the fluids. On whatever peculiarity of combination this change depends, we find one circumstance always necessary to its taking place; this is, the abstraction of two principles formerly noticed, Carbon and Hydrogen, in a certain degree, which principles constitute the base of most of the nourishment the body receives. This abstraction, therefore, may be equally carried to excess; and from this source of too strong a disposition to the formation of Fibrina, diseases may arise, as well as from the cause formerly noticed. This will be the more particularly apt to occur in the minute parts of the system, where a natural tendency to obstruction prevails, and where the lymph, the part of the fluid most concerned in the formation of Fibrina, and liable soonest to assume this state, only circulates. In order to judge properly of this effect, it will be necessary here to take some view of that minute and extensive division of the vascular system, termed Lymphatic; first, as to its arrangement and distribution; and, secondly, as to its nature and properties.

The Lymphatic System takes its origin every where from the surfaces of the body, external and internal, and the extremities of its small irritable vessels, open by what are called pores. Their figure is nearly cylindrical; they are plentifully filled with valves, in order to prevent the regrefs of their contents; and they terminate at certain places in glands which consist of the union and ramification of a number of their single tubes. The fluid they contain is entirely of a pellucid nature, from whatever source it is derived. The extent of these vessels is much greater than any other series in the body. Their number, in particular places, seems proportioned to the necessity that there is for their use; but, on a general calculation, it appears from dissection, that for one artery we find two veins, and no less than four lymphatics. Hence the Lymphatic System bears a proportion to the other vessels, as four to one; and hence, in the same proportion, is it liable to prove the source of disease. The valvular construction of the Lymphatics has been considered as one of the leading distinctions from the other vessels, a distinction which has even given them name. Hence the peculiarity of their construction, necessary, as it would appear, to the passage of their fluids in animals which use the erect posture, is one source of their liability to disease, as permitting no retrograde motion when obstruction once occurs. In the course of their progress, the lymphatics terminate in small knots or clusters, termed from their shape conglobate Glands. When they reach these glands they divide into a very great number of branches, which

which are so minute, that it is difficult to force a penetrating injection through them. When successful by this injection, it is found, that after dividing within the gland, the extremities of the vessels open into cells which are natural to these glands, and in which their contents are deposited. In tracing the lymphatics through their course, two sets of them are conspicuous, an external and an internal. The former accompanies the subcutaneous larger vessels, the latter the arteries and deep-seated veins. It is the former that chiefly claims attention, as they are almost exclusively the seat of this disease. Hence Cancer is oftener met with in the breast, axilla, and jaw, where these glands are most numerous, than in any other parts of the body. From this structure of the glands, the minute division of their vessels, the valvular construction of these vessels, and the numerous follicles or cells into which the glands divide, the tendency to obstruction must, at all times, be great, and liable to take place on the slightest injury or derangement of their circulation. We can have no doubt that this structure is essentially necessary to the different purposes of secretion; and as it is so, we find Nature endeavour to counteract the tendency to obstruction and disease, by constantly embedding all these glands in a quantity of fat or adipose substance, as a guard for their protection from injury, to facilitate their circulation, and by its absorption to serve other purposes to be afterwards noticed. Hence the fat is of the utmost consequence to these glands, in continuing their folliculous vessels in a healthy and permeable state.

This circumstance of the accumulation and changes on the situation of the fat in the progress of life is a subject of the first importance, as shewing the efforts of the system to prevent its annihilation. In the earlier period of existence, when the vital powers are strong and active, Nature is chiefly anxious to preserve the life and circulation of the exterior and smaller vessels. The fat therefore, as the means of doing this, is chiefly accumulated on the external parts, and thence as it must, like the rest of the body, suffer a perpetual series of changes, it is resumed into the circulation, and supplies that principle which the body requires in addition to the other ones received through the principal organs to the general circulation. As life advances this distribution of the fat becomes changed. It gradually leaves the external parts, and is drawn from the surface to the interior recesses. Thus Nature forsaking, as it were, the more distant parts of the system which are doomed to decay, and which she is no longer able to support, accumulates that principle which preserved the exterior parts in health, on the internal viscera, for the purpose of preserving the larger vessels, and more vital parts, as long as possible, from falling into the same state.

state. By this beautiful distribution the energies of life are longer maintained; nor are the changes on the quality of the fat less conspicuous than its situation. The fat of the child is firm and insulated, so that the absorption of it may not take place in a degree beyond what is necessary for the wants of the system. In manhood also it is distinguished by considerable firmness, without much humidity or oiliness; but in age it is so remarkable for the change, and is of such a fluid oily nature, that every anatomist has taken notice of it as one of the chief inconveniences that attends the dissection and preparation of older subjects. On the same principle, that the fat serves to preserve the vitality of the smaller vessels in early life, the accumulation of this substance can be accounted for in all the animals of the colder regions. The lessened temperature, which particularly attacks the circulation of the surface and minute parts, is thus counteracted; while in the warmer regions, from the opposite cause, and the more invigorated state of surface, no accumulation of this substance takes place; on the contrary, rather a deficiency prevails. The composition of fat, when chemically examined, we find to consist of five parts of Carbon and one of Hydrogen. Its accumulation by the smaller vessels in distant parts, shews that these principles abound in the system which occasions this accumulation, and therefore when a change takes place, either they do not longer remain in the system in the same quantity as before, or in the same proportion; or, if so, the vessels are no longer suited to make the same extrication of them as before.

From this statement, we are induced to conclude, that at the period when Cancer is apt to occur, an alteration in this fatty substance prevails. It acquires a morbid firmness or consistence, and is no longer capable of conveying to the gland that utility it formerly displayed. At the same time, the vessels themselves begin to lose that energy conspicuous at an earlier period of life. The concurrence of these circumstances, we contend, produce all the consequences that ensue in Cancer, and that this disease consists in an excessive or morbid disposition to the formation of Fibrina, which, though general throughout the system, is particularly displayed in those parts where the structure, nature of the circulation, and changes induced by period of life, favour it more strongly than elsewhere. To render this clear and perspicuous, we shall examine the dissection of the parts in this disease, as far as these dissections have been made by authors. All such dissections uniformly concur in the regularity of these morbid appearances.

1. The first is a thickening of substance in the parts.
2. The second is an increased hardness, amounting often to a cartilaginous state.

3. The

3. The third is the appearance of membranous septa, where no membrane was formerly conspicuous; an appearance remarked by Dr. Baillie as strongly characteristic of this malady.

From these facts there clearly appears an apposition of solid matter to the part; and this apposition naturally presupposes, 1st. A morbid deposition of the principles which go to frame it; and, 2d. An obstruction in the parts to the removal of this deposition when thus made.

With this knowledge of the actual morbid state, we are naturally led to a nearer view of the principal symptoms which characterise the progress of the malady.

[To be continued.]

Cases admitted under the Care of the Surgeon of the Finsbury Dispensary, St. John's Square, Clerkenwell, from the 10th of August to the 10th of September, 1802.

Phlegmonë Artuum - - -	2	Contusiones - - - - -	6
Testis - - - - -	1	Lues - - - - -	3
Offis Sterni - - - - -	1	Gonorrhœa - - - - -	4
Erysipelas - - - - -	2	Scrophula - - - - -	2
Abscessus Artuum - - - -	4	Herpes - - - - -	1
Articulorum - - - - -	3	Tinea - - - - -	2
Mammæ - - - - -	3	Psoriasis - - - - -	1
Mortificatio Artus - - - -	1	Eruptio Papulosa - - - -	1
Ulcera Faucium - - - - -	2	Tumor Albus Carpi - - -	1
Artuum - - - - -	8	Prolapsus Uteri - - - - -	1
Fistula in Ano - - - - -	1	Clavus - - - - -	1
Leucoma - - - - -	2	Paralysis Artuum - - - -	3
FRACTURA Costarum - - - -	2	Hæmaturia - - - - -	1
Luxatio Carpi - - - - -	1		
Vulnera Capitis - - - - -	2		
Artuum - - - - -	3		
		Total	66

It is an observation which is daily made by Surgeons, of which experience sufficiently proves the validity, that the diseases of no organs which fall under their notice, present to them so great difficulty in the management, as diseases of the bones. We should, indeed, à priori, without the assistance of practical observation, have supposed this to be the case, from an examination of the peculiar structure of these organs; for we find that they are equally vascular, and as liable to disease as softer parts; with this particular disadvantage, that their vascular structure is enveloped in a matrix, which presents difficulties to the evolution and production of those phenomena which are

are characteristic of disease; and therefore, in its progress, more exertion is necessary, and more injury sustained, in the proper accomplishment of those alterations of structure or of form.

If a bone inflames, as inflammation cannot exist without some degree of swelling; and as the bones are firm and unyielding, as the osseous matter, while in its healthy situation, will not suffer the vessels to enlarge, it becomes a point of necessity, that a part of the earth of the bone should be removed to a greater distance from the expanding vessels; which is the fact. If an abscess forms in the bone, a proportionate opening must be made by the absorbents, through the bony fabric, to give egress to the matter; which being a work of difficulty, the cavity of the bone sometimes becomes filled with matter, and the most dreadful disease is the consequence. If a part mortifies, a separation must take place between the sound and unsound parts. Should the dead portion, happily, be situate on the external part of the bone, it is more easily cast off; but should the internal part be carious from destruction of the medullary artery, a difficulty occurs which Nature can seldom overcome, and the limb generally falls a sacrifice to the disease.

The powers of Nature, therefore, in diseases of the bones, exert themselves to accomplish the same means of redress, as in analogous diseases of other parts; but the peculiar structure of these organs not unfrequently renders these efforts inefficient.

I have been led to reflections on these diseases by several circumstantial facts which have recently presented themselves to my observation; which have inclined me to believe that bones feel the effects of slight external causes oftener than is generally imagined.

The patient in the above list, (*Phlegmone Sterni*) above four months ago, received an accidental blow on the sternum, by the elbow of her husband while asleep, which was not regarded at the time, nevertheless she felt some degree of pain in the part, at times, of a dull obtuse kind, which however, did not excite in her mind any alarm, till within a month, (three months after the accident) when she thought that there was some enlargement, and the pain increased to such a degree, that a week ago she presented herself for advice and assistance; there is now very considerable enlargement of the sternum, evidently of the bone, and arising either from an enlargement of the substance of the bone itself from the tumefaction which always takes place in inflammation, or from the formation of an abscess in the anterior cavity of the mediastinum, which, by its distension, propels the bone forward. The patient, as is generally the case in diseases of the bones, is constitutionally affected, extremely debilitated, with an entire loss of appetite,
sleepless

sleepless nights, and considerable pain. The small length of time in which she has been using the means for recovery, will not allow of any satisfactory information respecting the progress of this disease; the pain, however, is very considerably abated by the effects of one blistering plaster which has been applied. It is my intention to continue the use of these, applied in succession as fast as cicatrization shall take place, with the internal exhibition of cinchona, opium, &c. &c.

Mr. Hill, of Chester, in a late Number of the Medical and Physical Journal (vol. vii. p. 415) has made some very judicious remarks on diseases of the bones, and has given cases of the kind wherein bruises of the bones have produced very formidable diseases, and death, from a deposition of bony matter on the external surface of the bone; and he says "Perhaps no hurt, however small, is inflicted on a bone without a greater or less degree of this process taking place." I know that in cases wherein bruises have been inflicted on a part where the bone lies very near the surface, being covered with little more than integuments, the effects of that bruise are sensible to us much longer than would be the case in parts of a softer nature.

A gentleman received a kick from a horse on the chin, which did not abrade the cuticle, yet he experienced a pain upon pressure on that spot many years, and the bone seemed to the touch enlarged on that side. Another gentleman sustained a blow on the shin, which just grazed the external integuments, and a slight degree of enlargement of the part with pain on pressure, has remained ever after. A lady, by a fall from a horse, scratched her face by the gravel of the road, and ever since has experienced considerable tenderness of the nose (the bone being at that part most thinly covered) from the friction of a towel. Do these trivial effects, which remain after slight accidents of this kind, proceed from ossific inflammation and deposition, or from periosteal thickening only?

We cannot, in diseases of the bones, give that decided relief which we are enabled to administer to similar diseases of soft parts, nevertheless we are able to afford very considerable assistance; it is promulgated, as an idea, by some, that we should not interfere in the separation of carious bone, as Nature is fully competent to the performance of this operation. Nature and time certainly will accomplish the exfoliation of portions of bone of any magnitude, if on the external part of the bone, provided the constitution will support the effects of the means which she employs: for as a portion of carious bone must be considered as a body extraneous to the system; a body not entering into the channel of the circulation; an extraneous body of

of the most mischievous kind; as, while this remains, there will exist ulceration of the superincumbent soft parts, perpetual discharge, continual irritation, and frequently re-iterated attacks of inflammation, if the extent of the disease be considerable, the vigor of the most robust habit must decline; I would therefore always, where, from the local situation of the disease, the operation were practicable, prefer the more active practice of removing the diseased portion, to the more passive, tedious, and often hazardous custom of committing the case to Nature. I have a case at present under my care, of a man, who for a long period of time (the exact date escapes my recollection) has had a disease in the bones of the sternum; he has several small apertures through the integuments and muscles, from which exudes a continual purulent discharge; and through which sinuses extend to the bones, which may be distinctly felt by the probe, in a carious state; he has very frequent attacks of inflammation of the adjacent parts, which are attended with extreme pain, and general irritation and distress. I have recommended, and certainly would perform, (were the patient willing) an operation for the removal of the offending cause, which might be done with perfect facility by exposing the bone and separating the morbid portions by a small trephine.

In fact, I think that the removal of extraneous matter from the body, whether of dead portions of bone, formed within the body, or of other substances which may in any way have gained access, ought to be the invariable *endeavour* of surgeons; there may be cases where an exception may be made to this as a general axiom, where perhaps the continuance of the extraneous body may do less injury than an operation for its extraction; where the body is of an obtuse, smooth, and globular figure, as bullets, &c. which have frequently remained many years buried in the body, forming for themselves a sac, without producing ill effects, if unaccompanied by wadding, pieces of cloth, &c. But from the neglect of, or the unsuccessful attempts in removing extraneous bodies of a different form, I have been witness to the most dreadful effects. A case of this kind has recently occurred to me, which terminated fatally, from an apparently trivial cause. The patient by a fall from a chair on which he was standing, received a wound just over the great trochanter of the thigh, by a piece of the birch of a broom on which he fell, which he immediately drew from the wound, which was apparently of no consequence, as it seemed merely to penetrate the skin; he accordingly did not notice it, but was in more pain than he could have expected from such a circumstance. In a week my attendance was desired, when I found

found a considerable degree of tension and inflammation of the *anterior part of the thigh*, and about the *groin*, but the integuments about the *wound* were flaccid, and the *wound* itself nearly *healed*; I feared much that some portion of the wood remained in the thigh, though he repeatedly assured me that it could not be, from the nature of the piece which he extracted, it being smoothly cut at the end and not ragged, as it would have been were it broken in the wound. Being however rather sceptical respecting his assertions, I enlarged the orifice to some extent, but could discover no remnant of the wounding substance; indeed, the swelling was far from the orifice, and continued to recede farther from it, and in the course of a fortnight an abscess pointed diametrically opposite to the trochanter; this abscess being opened, it continued to discharge most profusely for several weeks, during which time the patient became most completely hectic, in resistance to all the support which was contributed to his relief, when a thick piece of wood, about half an inch in length, was discharged; so much exhaustion had however previously taken place, that he died in a few days. It may reasonably be inferred, that had chirurgical assistance been procured in the first instance, before the offending cause had eluded observation, no ill consequences would have occurred; but at the time I first saw him, as the most prominent part of the swelling was over the groin and upper part of the thigh, extending inwards, it is probable that the offending cause was in that situation, passing over the bone, and under the large vessels of the thigh. It is somewhat remarkable that the original wound should heal with such a body in it, as it was nearly cicatrized before I enlarged it, nor was there any sinus shewing the direction of the wound, the parts healing behind the extraneous body as it passed along; and afterwards it again healed as readily and with as little discharge as a simple wound of the same extent made by the knife could have done; this circumstance induced me to believe that I had in the first instance entertained an erroneous idea respecting the existence of some portion of the wood in the limb, till I was ocularly convinced of it by its appearance in the abscess.

No. 68, Hatton Garden,

J. RICARDS,

A Reply

A Reply to Mr. CRUIKSHANK's Observations in Defence of the New System of Chemistry; in a Letter from Dr. PRIESTLEY to Dr. WOODHOUSE, Professor of Chemistry in the University of Pennsylvania.

[From the Medical Repository, edited by Drs. Mitchell and Miller, and published at New York.]

DEAR SIR,

THOUGH you are an advocate, at least in part, for the new theory of chemistry, the principles of which I controvert, your candour is such, that I wish to address to you what I have to reply to the observations of Mr. Cruikshank on the subject of the experiment with *finery cinder and charcoal*, which you repeated in a manner that does you the greatest credit.

These two substances, though heated separately till no air or vapour of any kind can be expelled from them, yet when, immediately after this, they are heated together, they yield a large quantity of air, a great proportion of which is inflammable; and the new theory, which excludes phlogiston, requires that this inflammable air be a component part of water, which, of course, must be found in one or other of the two substances. Mr. Berthollet thinks it was contained in the charcoal, notwithstanding the heat to which it had been exposed. You allow, with me, that it was in the finery cinder, though we differ with respect to the decomposition of it. But Mr. Cruikshank has suggested a very different hypothesis; maintaining that water is not at all necessary to the production of this inflammable air; asserting that metals and their calces, in a very high temperature, have the power of decomposing fixed air, and that, in this case, the fixed air comes from the oxygen in the finery cinder, and the carbon in the charcoal.

After repeating my original experiment, which he found to be just, he did the same with the calces of other metals, particularly those of zinc, copper, lead, and manganese, and then concludes, that "in all these cases the air must come from the partial decomposition of the carbonic acid by the calx, when raised to a high temperature." But the inference that I think is more naturally drawn from them, is, that all these calces contain much water, and little or nothing else. This I have shewn to be the case with respect to several of them, especially that of zinc, and I doubt not but that some small portion of oxygen may be contained in them all. Indeed, we cannot absolutely say that any substance can be wholly expelled from any other with which it has been intimately combined by any process.

Before Mr. Cruikshank admitted that iron, or its calx, when

raised to a high temperature, can decompose carbonic acid (fixed air) in this experiment, he should have tried whether it would do it in any other. If in any case, I should think it would do it when it was heated in this air by a burning lens, by which a greater heat can be produced than in any open fire. But this I found not to be the case, either with iron or this calx of it. In the last summer I went through a course of experiments with this view; but I always found fixed air not to be decomposed by this means; though I found that a portion of this air, and also of all the other kinds of air that are readily imbibed by water, was rendered immiscible in water by means of *heat*, reflected either from the calx of any metal, a piece of earthen crucible, or any other substance on which I threw the focus of the lens, when it was surrounded by this kind of air, confined by mercury or water. This, however, was no decomposition of the air, as there was no oxygen found in it after the process. The addition of permanent air was always *phlogisticated*.

Mr. Cruikshank thought that if this heavy inflammable air came from the decomposition of the carbonic acid by the calx, he should succeed better by employing *iron filings* in the place of finery cinder, "as they would have a greater affinity with oxygen;" and with this view he heated them together with a quantity of "common *chalk*, previously exposed to a low heat for ten minutes." From this mixture he procured a great quantity of air, and he thought that the acid (i. e. fixed air from the chalk) was decomposed by the iron; whereas, when he used well burned lime he got little or no air.

What I infer from this experiment is, that the chalk not being perfectly calcined, contained some water as well as fixed air; and that this water, uniting with the phlogiston of the iron, formed the inflammable air that he found. Water I suppose to be the basis of all kinds of air, and many substances retain it in any degree of heat. Chalk I have found to do it after long exposure to the heat of a smith's forge.

Admitting the fixed air procured in the experiment with the finery cinder and charcoal to come in part from the oxygen in the finery cinder, how is this oxygen to be expelled from the calx, since heat will not do it? And there is no instance, I believe, in chemistry, in which, when heat alone will not expel any constituent part of a substance, it can be effected without the aid of an *affinity*, in consequence of which some other substance takes its place. But here, according to the new theory, nothing is supposed to take the place of the oxygen in the finery cinder, since it takes nothing from the charcoal, the iron being revived by the mere expulsion of the oxygen which made it a calx.

Mr.

Mr. Cruikshank lays great stress on the difference that he found in the air that he procured in these processes, from that which is got from charcoal and water. But I have observed that there is a considerable difference in the qualities of heavy inflammable air, not only according to the substance from which it is procured, but in the successive stages of the same process. He will find that I have examined this kind of air, as procured from a great variety of substances made to pass in the form of vapour through hot earthen tubes, and in various other ways, and have given the analysis of them. I always found that the first portion from charcoal was loaded with fixed air, but that, in the course of the process, this disappeared, the air burning with a lambent flame, and that towards the end it approached to the explosive kind, such as is obtained from the metals by acids.

I also found that more or less fixed air is procured by the decomposition of heavy inflammable air by means of dephlogisticated air; and though the air procured from finery cinder and charcoal shewed no sign of its containing any mixture of fixed air (nothing of the kind being discoverable by lime-water), yet when it was decomposed I found much more than the weight of the air, so that it could not have been previously contained in it in a state of solution, but must have been formed by the union of the oxygen in the dephlogisticated air, and the phlogiston in the inflammable air.

That charcoal, uniting with water, should give fixed air as well as inflammable air, I account for by supposing, what is by no means improbable, that this substance contains the elements of both the kinds of air, and that they want nothing but water to enable them to take the form of air.

On the whole, I think it is evident that Mr. Cruikshank finds fixed air in circumstances in which it cannot be formed, and makes it to be decomposed by substances which have no such power.

Submitting these observations to your better judgement,

Northumberland,
November 21, 1801.

I am, dear Sir, your's sincerely,
J. PRIESTLEY.

To the Editors, on the same Subject.

GENTLEMEN,

I Lately sent you, in a letter to Dr. Woodhouse, a Reply to the Observations of Mr. Cruikshank, in answer to one of my arguments

arguments in favour of the doctrine of phlogiston, which he says you will be so obliging as to insert in your next number. I have, since that, received a letter from a correspondent in Paris, in which he informs me that the chemists in that city boast greatly of those observations of Mr. Cruikshank, and say that I must now give up the controversy: I therefore beg, that to that letter to Dr. Woodhouse you would please to add this.

I am not a little surprized that such excellent chemists as the supporters of the new theory in France unquestionably are, should make so great account of the aid of a person who has abandoned the most essential part of their system, viz. the necessity of water to the formation of inflammable air. Mr. Lavoisier, treating of the inflammable air from charcoal and water, which is similar to that from charcoal and finery cinder, says, in his "Elements of Chemistry," p. 87 of the English translation, that "it cannot be disengaged from the charcoal, and must consequently be produced from the water." According to the new theory, the union of the oxygen, which is supposed to come from the finery cinder, with carbon, from the charcoal, can only form fixed air, and no kind of air that is inflammable. Mr. Cruikshank must therefore abandon the new theory in order to support his peculiar hypothesis.

If I do not receive a better defence of the new theory from its able supporters in France, I shall soon conclude that it is incapable of any just defence, and that, as becomes ingenuous men, they will abandon it, as Mr. Cruikshank has actually done.

I am, GENTLEMEN, your's, &c.

J. PRIESTLEY.

An Account of a Case of Pulmonary Consumption successfully treated by a Salivation; in a Letter from GEORGE PFEIFFER, M. D. to Dr. BENJAMIN RUSH.

DEAR SIR,

ALTHOUGH, in medicine, as in other sciences, the limited faculties, and, consequently, the limited knowledge of man, precludes the probability of his ever being able to form a perfect system, still does it afford matter of pleasure and encouragement to reflect, that by his experience, and the exercise of his reason, aided by those fortunate accidents which have always had so great a share in the prosperous issue of his affairs, he has been progressively conducted to the attainment of grand and important truths—truths by which many of the evils incident

to his condition here have been ameliorated or destroyed, and new sources of happiness opened to him.

One of the most pleasing subjects of contemplation afforded by the present period, so rich in moral and physical improvements, is the prospect of bringing into subjection to our art, a disease which has hitherto baffled the collected experience and skill of the whole medical world, and annually given to the grave its thousands and tens of thousands of victims.

This prospect was presented to my mind by the perusal of three letters, written by you to Dr. Miller, of New York, on the salutary effects of a salivation, and also of tonic remedies in pulmonary consumption.

Do not think I mean to flatter you, Sir, when I declare that I never read any thing in my life which excited a feeling more nearly approaching to ecstasy, than did that little production.

Instantly I determined to avail myself of so promising a practice in the very first consumptive case that should offer itself to my attention.

Besides several doubtful and complicated cases, I have lately met with one which, to me, appears unequivocally to have been a true phthisis pulmonalis.

In the hope that it will give you some satisfaction, I take the liberty of transcribing the history of it for your perusal.

— Will, aged fifty-five years, a tall, slender man, by trade a house carpenter, when labouring under a catarrh, in the summer of the year 1794, was suddenly seized, during a violent fit of coughing, with an alarming hæmoptoe, by which he lost a considerable quantity of blood, and his strength was much reduced. It was soon checked, however; and though there were several slight returns of it, he, in a few weeks, recovered his usual share of health, and followed his trade without inconvenience, till the autumn of 1798, when he suffered an attack of the yellow fever. Since that period he thinks he never has felt so strong as he did before; and through the course of the last summer his strength declined so rapidly, that by the beginning of September he was scarcely able to continue his work; and towards the end of the same month he was seized, as he thought, with the bilious fever, which was then the reigning epidemic in Philadelphia, and very prevalent in the Northern Liberties, where he resides. But the symptoms of his disorder, from the very beginning of his confinement, so far as I have been able to collect them, both from his own mouth and his wife, instead of bearing the character of our autumnal remittent, were rather characteristic of hectic fever and advanced pulmonary consumption. They were frequent and irregular alternations of chills, fever and sweats, with pain in the thorax,

and a distressing heavy cough, which was most severe at night, attended with a copious expectoration of pus-like matter. There was also a steady, and often an excruciating pain, in his left hypogastric region, but no perceptible enlargement. Under these symptoms I found him labouring early in December, when I first saw him, and so weak as to be unable to rise from his bed without assistance.

A few minutes at his bed-side were sufficient to impress my mind with the most thorough conviction that he was far advanced in phthisis, and that, without speedy relief, he would probably not live more than a few weeks, and certainly not till spring. He had taken some medicines, amongst others nitrous powders; but without any relief.

I immediately prescribed your nitrous antimonial powder, with a little opium, and from half a grain to a grain of calomel in each, and directed him to take three powders daily. At night he took an antimonial anodyne draught; and on the painful side I ordered a quantity of warm spirits, or camphorated spirits, to be rubbed several times a day. This course was pursued for about ten days, when, observing no effect to be produced on his mouth by the powders, I ordered, in addition to them, strong mercurial ointment to be applied to his side twice a day, instead of the camphorated spirits.

After an ounce of the ointment had been used, a gentle salivation began, which continued about three weeks, with scarcely any inconvenience to the man, who took no other medicine, after the salivary disease was induced, but a paretic draught occasionally.

As the spitting progressed, all the symptoms of his disorder gradually subsided; and, by the time it ceased, his irregular chills, fever and sweats, as well as the purulent expectoration, and the pain in his side, had entirely left him. Only a slight cough remained, which was soon vanquished by the paretic draughts above mentioned. His appetite and strength returned, as if by a charm, and, on going to his house a few days afterwards, I was both astonished and delighted to find him hard at work with his saw. He declared he felt perfectly well, and was not at all fatigued by his labour. I advised him to take two or three glasses of Madeira wine every day, for some time, to keep his bowels open, and wear a flannel shirt next to his skin. I saw him, for the last time, on the 23d instant, when he still continued in perfect health.

Thus, Sir, have I given you a faithful account of what, to me, appeared a desperate case of disease, and which I had very faint hopes of being able to conquer, even with the aid of the Hercules of Medicine, although I had your powerful testimony in its favour, and my own knowledge of its general and unexampled efficacy.

As the issue has turned out, I contemplate myself as having been, through you, the humble instrument of rescuing a fellow creature from certain death.

Believe me, dear Sir, I consider myself greatly your debtor, and am, with true respect,

Philadelphia,
January 29, 1802.

Your obliged friend and humble servant,
GEORGE PFEIFFER.

*Remarkable Cases of Madness; communicated by Dr.
JOHN VAUGHAN, of Wilmington*

[From the Medical Repository, edited by Drs. Mitchell and Miller, and published at New York.]

IN presenting you with the following account of a family-mania, I am flattered with the belief, that it will be ranked amongst the wonders of the nineteenth century. When witchcraft and conjuration swayed the sceptre of public opinion, the narration of this fact might not have excited much attention: but in the present day it will be deemed an interesting evidence of the frailty of the human mind.

The family in which this infectious mania occurred live a few miles north-west of this borough, and have long been esteemed industrious, orderly people, until August last, when they became infatuated with the notion of being *possessed with an evil spirit*.—Their phrenzy is thus described by a respectable farmer, who was an observer of a part of the tragedy:

“On the 3d of August, 1801, S— S— came to his mother’s (who had been insane for some time) to settle some business with her, when she caught him round the neck, and kissed him, telling him he should become a preacher of the everlasting gospel, when *he* immediately became crazy, and thought he was inspired. On the evening of the next day she kissed him again, and also kissed two other sons, two daughters, and two daughters-in-law, and the whole of them became frantic immediately.

“On the morning of the 5th I was sent for in great haste, when I found the whole family in the utmost confusion, believing they were possessed with an evil spirit; adding, that their mother had died a week before, and Satan had entered into her body, and communicated himself to the rest of them by *a kiss*! Under this impression, they had dragged the old woman out of bed, and nearly beaten her to death. After a considerable struggle I rescued her from them, and laid her in bed. They then en-

deavoured to set the house on fire, to consume the tormenting demon in the image of their mother; but several of the neighbours collecting, we separated them, and prevented further mischief. In the course of a few days they all became peaceable and rational but John, who afterwards became your patient.

“WILLIAM SIMONSON.”

Of the truth of these circumstances, related by Mr. Simonson, there can be no doubt. I have, for many years, known him to be a man of unquestionable integrity, and highly respected in his neighbourhood, and, as he lived within a few rods of the infected family, I applied to him for an account of the fact.

John S—, who is mentioned as becoming my patient, remained irascible after the recovery of his brothers and sisters, and was confined in the Paupers' Infirmary for a few days, where he was freely blooded without relief; and on the tenth day of his disease he was brought to the house of a relation in this town.

I was called to see him on the following day, when I found him chained to the floor, with his hands tied across his breast—cloaths torn off, except his shirt—his feet and elbows bruised considerably—and his countenance, grimaces, and incoherent language, truly descriptive of his unhappy condition. As he was free from fever, and his pulse not tense nor preternaturally full, I deemed this a fair case for the application of cold water, as recommended by Dr. G. G. Brown, in *apoplexia mentalis*, or *delirium sine febre*. (See Med. Rep. vol. iv. p. 209.) Accordingly a linen cloth was wrapped round the head, and wetted every few minutes, by a sponge, with cold water, for five hours, without any sensible effect.

On the twelfth morning of the disease it was resumed, and continued until it induced chilliness; and as it produced no relief, his friends became impatient of a remedy apparently simple; and on the next day his head was shaved, sixteen ounces of blood taken from the arm, and a cathartic exhibited. The succeeding night he slept tolerably well, but remained incoherent; and on the fourteenth morning a blister was applied to the scalp, and the purge renewed, which relieved him so far as to enable him to go home, and attend to the business of his farm. He, however, retained some idea of his previous delusion, and believed he was commissioned to be a preacher, and entitled to support from the public; but the infatuation gradually wore away, and he is now perfectly restored.

The rest of the family remain well. The old woman actually died in a short time after the melancholy scene of confusion before-mentioned.

This

This case affords ample source of speculation to the metaphysical pathologist who wishes to explain the morbid affections of the mind and body. For my part, I confess myself much at a loss to attempt any explanation of this extraordinary form of mania, independent of any previous bodily disease. Dr. Rush denominates mania a state of fever, but I presume the present affection is an exception to that doctrine.

It may be observed, that the mother had been, for some months, in a chronic state of insanity; and as her children, no doubt, were much interested in her condition, their affections wrought up, at this juncture, by a final settlement of business which impressed them with apprehensions of her being irrecoverable, together with the predisposing force of prejudice and credulity, may have favoured the fanatical impression.

I find, on a minute inquiry of some of the connections of the family, that the whole of them embraced the idea of John's being commissioned to preach the gospel, and they accordingly initiated him in the functions of a minister, by the performance of the ceremonials of their church.

That physical something, usually stiled sympathy, which is considered as the source of compassion, which is excited into action by the sight of our fellow creatures in distress, may be susceptible of morbid influence beyond satisfactory explanation. It is well known that convulsive affections have been induced by the sight of persons labouring under them, and heroes have been known to weep at the impressive spectacles of destruction made by their own victorious arms, on the reflection that such might be the fate of their own country, or their own friends.

The phrases, *sympathetic action*, *consent of action*, and *associated action*, are becoming familiar in medical language; but, are they not rather medical expressions used to illustrate a connection or relationship between the different parts of the system, instead of designating any peculiar law of the animal economy? We find that sympathetic or associated actions vary with the states of the system. Pestilential miasmata will at one time excite vomiting; at another time muscular debility, or languor; and, perhaps, a third time febrile action; and are frequently inefficient in producing disease of any kind, from the non-concurrence of a predisposing cause. Thus also are mental impressions varied by incidental states of the system. At some times the mere sound of death will excite horror, and at other times the devastations of pestilence are viewed with as much indifference as if we were invulnerable. And, upon an extensive view of the dispositions and actions of mankind, it would seem as if some persons were constitutionally devoid of sympathy,

sympathy, and those tender affections which ennoble the character of man; or, from an unfavourable hebetude, are insensible to those impressions which frequently torture the minds of more susceptible beings. Therefore, predisposition of body, and sympathy of mind, probably deserve an equal rank in the formation of corporeal and mental diseases.

Admitting the stomach to be the centre of association in the establishment of febrile diseases, may not the *sensorium commune* be entitled the centre of association in mental disorders? The connection of the animal functions, and their general dependence on the state of the stomach, in particular, are not more evident, in my opinion, than the relation subsisting between the *sensorium commune* and the internal senses, and the dependence of the latter on the impressions made on the nervous sensorium, or common receptacle.

The immediate influence of the mind on the nervous system, and the agency of the latter in the operations of the mind upon the system, render it probable that they are concerned in the formation of that sympathetic orgasm which I suggest as the predisposition to mental disorder.

The translation of diseases from the blood-vessels to the brain and nervous system, and the transformation of febrile action to mania, also evince that physical relationship so frequently mentioned by physiologists, as connecting mind and body, and subjecting each to a participation in the morbid affections of the other. This intimate connection, however, does not invalidate the doctrine of separate orders of idiopathic disease. Paraticism appears to be as much a primary mental disorder, as febrile action is a vascular disease.

In three cases of fever, which occurred last autumn, the transformation to mania was complete, and perfectly consonant with Dr. Rush's theory of the maniacal state of fever. In the first case a remittent form of fever became an intermittent hysteria. After a slight nervous agitation the patient would become frantic alternately laughing and crying for several hours. The paroxysms resembled intermittent fever in the regularity of recurrence and the term of duration; and were, accordingly, removed in a few days, by the use of *asafoetida* and Peruvian bark in the intermissions.

A second case of remittent fever terminated on the fifth day, in a moderate sweat; and the sixth day I pronounced my patient free from disease, and recommended a convalescent regimen. On the seventh day I was called to him again, and, to my great surprise, found him maniacal, with a feeble and frequent pulse, and cool skin. Suspecting the change to be a translation of morbid action from the vascular system to the brain,

Applications of Galvanism to medicinal purposes

Fig. 1.

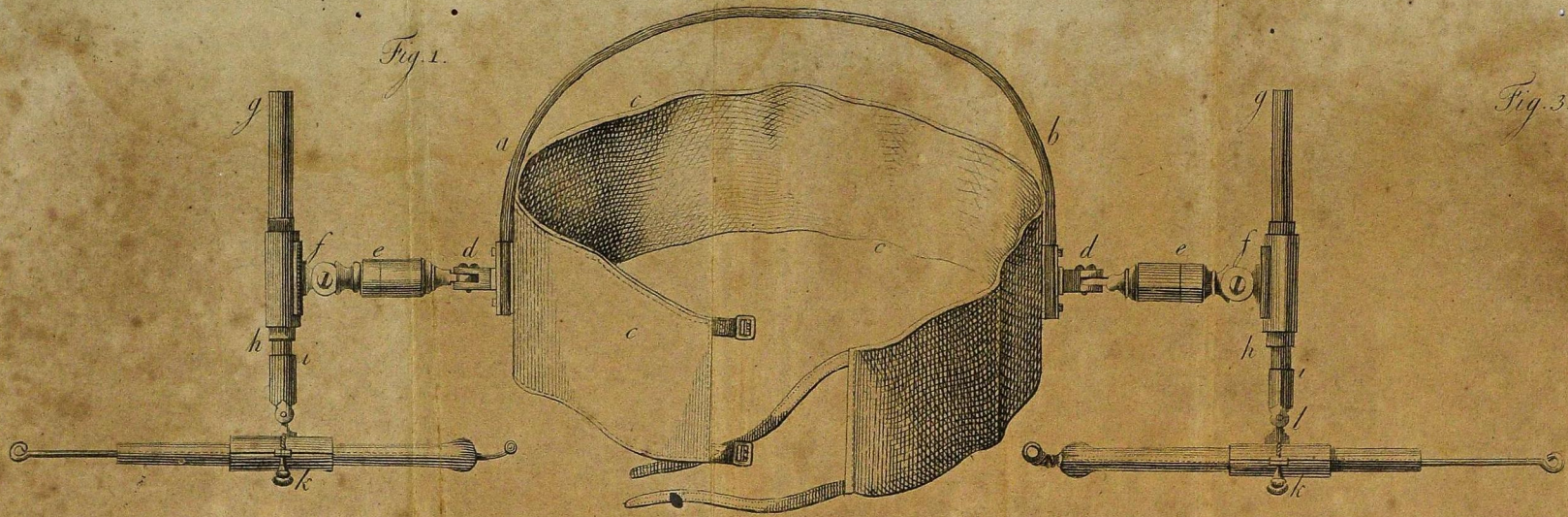


Fig. 3.

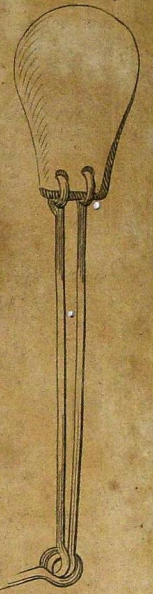


Fig. 2.

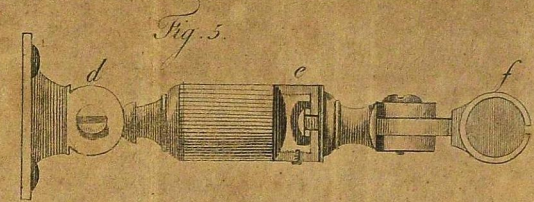
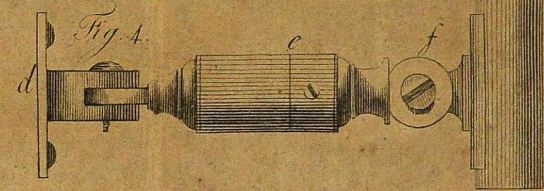
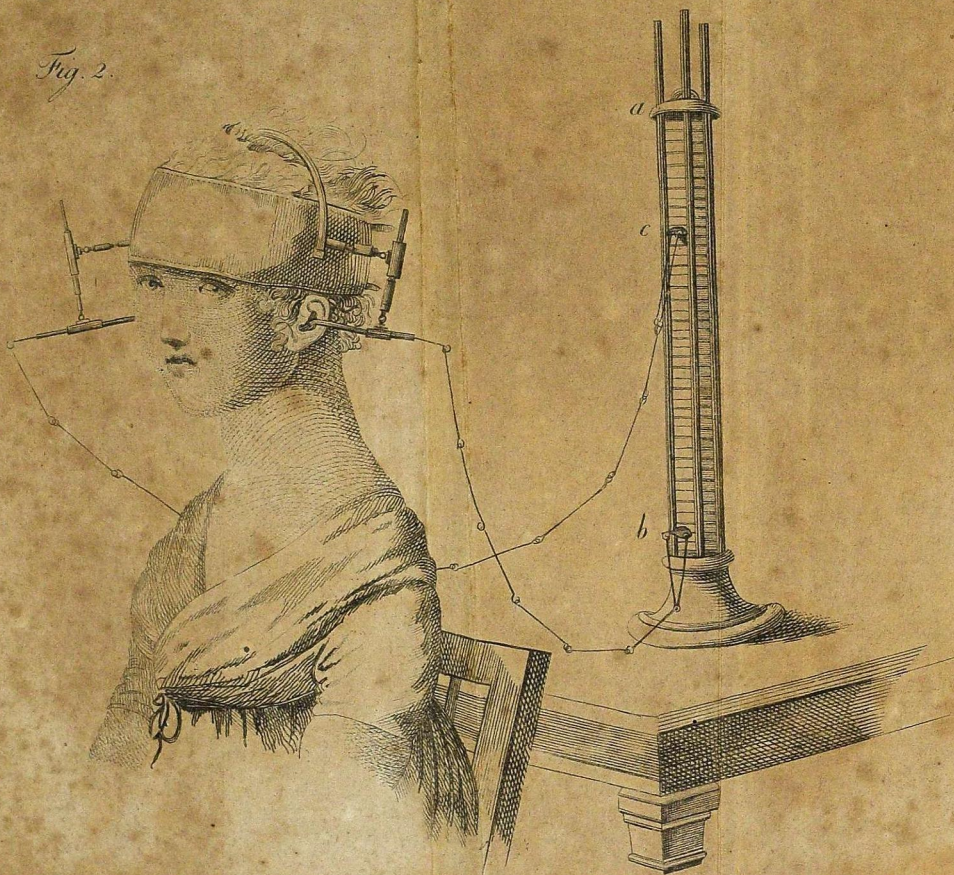
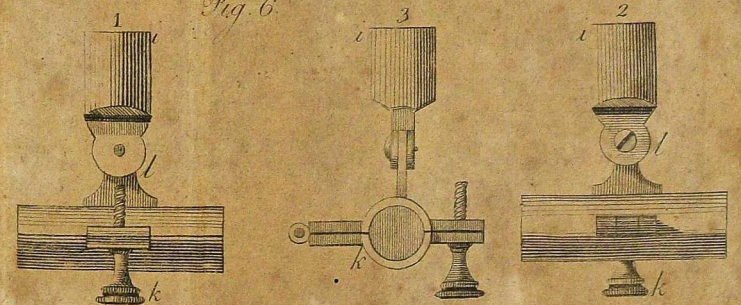


Fig. 6.



brain, I endeavoured to relieve the latter by the application of cold water to the head for thirty-six hours, without any effect but an occasional shuddering sensation. Afterwards I attempted a revulsion of excitement by the application of blisters to the scalp, hands and feet, with no better success; and, finally, to excite counter action in the stomach by stimulating draughts. After remaining *in statu quo* for several days, my patient was put under the care of one of Mesmers' disciples, who professed wonders, and promised no less; and with earnest wishes for his better success, and strong apprehensions of disappointment to the relatives, I submitted to the transfer; and the result confirmed my expectations.

A third case, to which I was called in the last stage of the disease, was similar in progress and termination to the preceding.

It is also worthy of remark, that the diseases of last autumn affected the brain and nervous system in an astonishing manner. The most trifling casualties sometimes produced delirium; and insanity and suicide were, throughout the country, frequent beyond example. I have sometimes queried, whether there might not have been an epidemic constitution of atmosphere, resembling the pestilential constitution of the air described by Sydenham, and believed, by many, to have existed in our country for some years past. The *maladie Anglaise* is imputed to the influence of a November atmosphere.

In consequence of Dr. Miller's reasoning on the morbid functions of the stomach, I refer these facts and observations to him; with the simple query, whether the fanaticism of the S— family be accountable for on the sympathetic connection existing between the stomach and nervous system? or, whether it be not exclusively a mental affection?

Observations and Experiments, made with the view of employing Galvanism for the Cure of several Diseases; by Dr. GRAPENGIESSER, of Berlin; with an Engraving.

[Continued from pp. 250—259.]

Sec. 3. *ON the Action of the Galvanic Battery in general, and especially with respect to its Relation to Electricity.*—In order to analyse the properties and nature of Signor Volta's remarkable apparatus, but particularly to investigate its effects on organic bodies, I made a series of experiments on different animals, as well as on myself and several of my friends, the results of which soon convinced me of its great power, and intitled me

to expect greater effects from it than those which I had observed from the application of simple Galvanism. Indeed, there seems nothing equal to it in penetrating and exciting the nervous system; hence I concluded, after what I already so successfully experienced in employing simple Galvanism, that it might prove of the most extraordinary service in nervous disorders, chiefly in those originating in debility, attended with deficient irritability and activity of the system. Its specific action on the optic nerve, in producing the appearance of lightning in the eyes, I particularly considered as promising great efficacy for the cure of amaurosis. The action of the Galvanic Battery seems, in some measure, to have more analogy to Electricity than simple Galvanism; and the sensation produced by touching the two poles with two silver spoons, appears to some people very similar to the sensation occasioned by a strong spark from the Leyden phial. Others, however, think it quite different, and describe the sensation as more penetrating than common electrical shocks of equal strength. Mr. *Volta* himself, thinks the sensation produced by his new apparatus, more resembling the sensation caused by touching the *Gymnotus electricus* and *Raja torpedo*, which exactly agrees with a late opinion of Mr. *Humboldt*, communicated in one of his letters from America, who says, that according to his researches, the phenomena observed in those fishes are rather of a Galvanic than of an electrical nature. It is not yet sufficiently ascertained whether there exists a material difference between the phenomena of Galvanism and Electricity: With regard to the medical application, however, the former appears to differ in some essential points from the latter, which, according to my numerous experiments, I found to be the following:

1. *Galvanism seems to penetrate much easier, and, as it were, deeper into the nerves, which seem to be its best conductors; whereas electricity is more uniformly communicated throughout the whole animal body, over the surface of which it is universally spread.*

This is proved by the subsequent arguments.

a. Galvanism produces a peculiar irritation of the optic nerve and the organs of taste; or an appearance of light in the eyes, and a change of taste, which always ensue whenever a simple Galvanic chain is shut at any part of the face that is covered with a tender epidermis; or when a circuit of Galvanism is formed by means of the pile at those places to which the branches of the fifth and eighth pair extend. Although an electric spark may likewise occasion the appearance of lightning in the eye, it must be considerably strong, and either applied immediately on the eye-ball or on the neighbouring parts. On
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letting pass a strong spark from the Leyden phial to the frontal nerve, an appearance of light will be perceived in the dark, which, however, greatly differs from that Galvanic phenomenon.

b. The phenomena observed, by applying the Galvanism on separated animal parts, which are not yet wholly deprived of vital power, viz. legs of frogs, &c.

c. Galvanism, or the metallic stimulus, may serve as a means of distinguishing nerves from other organs.

d. On applying one conductor of the Galvanic battery to the mucous membrane of the nose, and the other to the frontal nerves, the whole net of nerves which is spread on the back of the nose and the upper jaw will be seen, so as to be able to distinguish their course and ramifications.

2. *The Galvanic Fluid seems to be much easier decomposed, than common Electricity within organic bodies as well as without.*

a. The Galvanic battery exerts a great effect on the nervous system, and produces the most violent shocks, while it hardly affects the electrometer; and in common cases the Galvanism of a battery of 100 or 150 strata is not indicated but by condensation.

b. Galvanism seems to set the inflammable bodies, as sulphur, phosphorus, gunpowder, &c. very easily on fire.

c. It has the power of decomposing water; all which proves its having a greater and quicker effect on organic bodies.

3. *Its action on wounds occasioned by a blister, and on the cuticular nerves and vessels, is such as is never produced by Electricity.*

4. I have as yet been able only to act by Galvanism on single parts, and consequently on topical diseases; whereas the whole system may be changed and acted upon by Electricity.

5. Galvanism is never conducted through the dry skin; but its action is immediately perceived as soon as the skin is wetted.

These are the differences by which the action of Galvanism is to be distinguished from that of Electricity, as far as it may be interesting for the practice of medicine, on which account we forbear to mention the other differences, pointed out by several Naturalists, as foreign to our purpose.

Sec. 4. *On the different Action of the simple Galvanic Chain, and of the Battery at its two Ends or Poles.* It is known that the simple Galvanic chain as well as the battery, act at their poles in a different manner with respect to intensity and quality. From my observations it appears, that the zinc side or zinc pole produces a greater effect than the opposite pole at the moment the Galvanic chain is shut, and as long as it remains so. On applying a plate of silver and another of zinc, connected

ned by a silver or gold chain, to wounds occasioned by blisters, the pain, shocks, and convulsions of the nerves, or the lightning, in case the branches of the fifth and eighth pair should be affected, are much stronger at the zinc side than at the silver side. A lymphatic humour begins to run from both wounds, which having continued for about six or eight hours, a thick eschar or gangrenous crust arises on the wound at the zinc side, while the opposite side continues to suppurate. On touching with wet fingers, the wires of the conducting plates of a moderately strong battery, the sensation is much stronger and penetrating at the zinc wire than at the silver side, where it is merely superficial, resembling a tension, as if the finger was swollen and inflamed. When the conductors of the two poles of the pile are brought into the meatus auditorius, that of the zinc pole occasions more violent shocks, and is more piercing; and the sound and tinkling of the ear which it produces, is stronger than that which is felt at the silver side, where the sensation is rather burning. In a state of diminished excitability the zinc pole alone proves active; but the silver pole not at all. On applying the conductor of the zinc side into the nose, and on taking hold of the opposite conductor with the wetted hand, a most insupportable acute pain will be occasioned, and a most violent effort to sneeze arise; whereas, when the conductor of the silver pole is brought into the nose, the pain is more dull, without any effort to sneeze. The action of the zinc pole on the eyes and tongue is likewise more intense, painful, and penetrating than that of the silver pole.

These phenomena, however, only take place the moment the Galvanic chain is shut, or when it is suffered to remain shut; for on separating it, the organ that is in connection with the silver pole, is more affected and irritated than that at the zinc pole; but this opposite impression is only momentary, and by no means capable of abolishing the effects produced by the primitive action in the interior organisation, as has been supposed by some Naturalists; because,

a. There always remains, after every experiment, more or less of the sensation that was primarily produced, which would never be the case if the opposite action, occasioned at the moment the chain is separated, had entirely supplanted, and as it were, neutralized the former.

b. The sounding and tinkling of the ears frequently remain on the zinc side when the organs of hearing have been galvanized.

c. There have been some changes produced in diseases, against which Galvanism was employed, which, however, would
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not have taken place if the first effects were abolished by the contrary action.

The differences which the two poles show with respect to the quality of irritation, are not so easily to be determined, as they are with difficulty perceived by several persons, and by some not at all. The experiments, therefore, intended for this purpose, should be accurately made and undertaken early in the morning, when the excitability is not yet diminished. It is particularly through the medium of the organs of sight and taste, that we find some difference in the respective action of the two poles. On touching the point or surface of the tongue with a zinc probe, and with a silver probe, any part of the body which is covered with a thin epidermis is deprived of it entirely, viz. palate, gums, nose, eye, urethra, &c. and on bringing the two metals in connection with one another, a *sourish* taste will arise; whereas, when the silver is applied to the tongue, and the zinc to the other parts, the taste becomes *alkaline*. This phenomenon is almost always observed, and there are few people who have not perceived it. From the analogy, therefore, which the simple Galvanism shows in most points with the Galvanic battery, we may be entitled to suppose, that it likewise takes place in the same manner at the two poles of the pile, which, however, is by no means the case; for most people perceive the *sourish* taste at the silver side of the battery, and the *alkaline* at the zinc side, a deviation from analogy which I am not able to account for. The same inconsistency between the battery and the simple Galvanic chain is observed in their respective action on the organ of sight, as the same pole of the battery and of the simple chain will produce opposite phenomena; that is to say, while one pole of the battery occasions a strong lightning, the same side of the simple Galvanic chain causes only a weak light, and vice versa. The phenomena produced by the action of the battery are accordingly differently modified with respect to intensity as well quality. The zinc side proves always more efficacious at the moment the chain is shut than the silver side; but when the chain is separated, the shocks arise from the latter pole: On bringing the eye in contact with the zinc side, and the hand with the silver side, a reddish dim light will be seen the moment that the chain is shut, and some time after; but on separating it, a shock is perceived at the silver side, together with the appearance of a strong bluish light. When the silver side, however, is connected with the eye, a strong bluish light will appear; but, on the separation of the chain, the light becomes weak and reddish. A connection of the eye with the zinc side produces a shock, and the appearance of light and colour; whereas,

whereas, on bringing the eye in contact with the silver side, the last phenomenon, without a shock, will be perceived.

Although the appearance and succession of the different phenomena of the Galvanic action are likely to vary according to the different degrees of excitability, they are all to be considered as different modifications of the same stimulus, which for the cure of diseases, ought to be properly adapted to the nature of each. I shall finally add a few remarks on an opinion lately advanced by Doctors Ritter and Treviranus. These gentlemen observed, that on forming a Galvanic chain in the following order, *muscle, nerve, zinc, silver, nerve, muscle*; the nerve which is armed with zinc is almost entirely deprived of excitability, while the other remains irritable; the excitability, however, may be resuscitated by changing the coatings of the nerves; whence they concluded, that Galvanism possesses at the same time the power of depressing and exciting, according to the different construction of the chain. It appears, however, more probable, that the nerve armed with zinc has been rather over irritated, and as it were, obtunded by the power of the Galvanic stimulus, which acting in a less degree on the nerve coated with silver, seems not to have been capable of extinguishing the excitability in this nerve: For else, how can a stimulus be thought to be at the same time depressing and exciting? an idea not at all adapted to our improved knowledge of organisation. I have besides frequently applied the Galvanism of the battery to both ears without changing the conductors; but I never observed that the power of hearing had been diminished at the zinc side, or increased at the silver side, which ought to have taken place if the above supposition was probable; but, on the contrary, all the efficacy seems to be derived from the zinc pole. The sensations occasioned by the application of Galvanism have been observed to return from time to time; for instance, the lightning appears some time after as evident as if the battery had been just applied to the eye.

Sect. 5. *On the Diseases in which Galvanism may be successfully employed.* From what we have above stated it appears, that Galvanism always acts as the most exciting power, under whatever circumstances and in whatever manner it may be applied; but though it chiefly affects the nervous system, it also quickens the circulation of the blood, and easily occasions palpitations of the heart in persons that are naturally subject to them. The circulation of the blood is particularly increased in that part to which it is immediately conducted, where, at the same time, it causes considerable congestions of blood. The action of simple and compound Galvanism merely differs in degree;

degree; the first is to be applied to those parts only which are covered with a thin epidermis, and the latter requires the parts to be previously wetted. But whenever the simple Galvanism is applied to excoriated spots, it obtains the additional property of acting as a *derivant*, by causing the issue of a great quantity of humours, which, however, properly originates in its exciting quality. In remarking the differences between Galvanism and Electricity, I mentioned, that I had as yet been able only to act on single parts and on topical diseases, as the whole body cannot be charged with Galvanism in the same manner as with Electricity, by being insulated. It is, however, in some measure practicable to act on the whole body by means of Galvanism, when it is brought from top to toe within the chain of the battery. This experiment I have frequently tried on myself with a moderate battery, by touching with one conductor the top of the head, and with the other the sole of the foot, during which experiment I perceived a slight appearance of lightning, my head grew dull, and my eyes became red. We ought, however, to be cautious in making the experiment with a very strong battery, as it is to be expected the Galvanic stream might pass through the skull to the brain and spinal marrow, and produce the most violent symptoms, though such an experiment may be applicable in cases of asphyxia. I gave in this manner five or six shocks to a rabbit, by applying one conductor of a battery of 150 strata to the forehead, which had been deprived of its hair and wetted, and the other to the os sacrum, by which the animal, however, was not killed but only most violently convulsed. The poor creature seemed to be quite exhausted after the experiment, it breathed with violent efforts, and became almost senseless. Several minutes after it crept away, and in the evening it began to eat again.

In general, diseases from direct asthenia, originating in debility with increased irritability, viz. in the generality of nervous and spasmodic diseases, the application of Galvanism is not to be recommended, as, according to my experiments, it seems to do more harm than good in these cases. The spasmodic disease of a young man, which had the appearance of a tetanic affection, beginning with a sensation in the feet, similar to the aura epileptica, got worse by applying the Galvanic action to the feet; and likewise a nervous head-ach was not cured, notwithstanding the repeated application of Galvanism. Persons, whose nerves are very irritable, are easily affected with nervous symptoms from the application of Galvanism to any part of the body. As the general action of this stimulus on the nerves consists in producing contractions and convulsions, it is not deemed

applicable in spasmodic diseases, in which the nervous system is naturally liable to the return of the convulsions without the accession of any extraneous cause. It is even observed, that on galvanising single parts of the body, the whole nervous system seems to suffer, or the irritation to be propagated beyond the part to which it is properly conducted. Thus, on applying the zinc conductor to the knee, and the other to the back of the foot, a painful sensation extending up to the belly is perceived by many persons. The diarrhoea, which Mr. Ritter experienced by remaining in contact with a battery of 100 strata for above half an hour by means of his arms, is likewise to be accounted for from the irritation having diffused itself to the nerves, which were situated beyond the Galvanic chain. Galvanism, particularly when applied to the head, causes congestion of blood towards the head, dullness, tooth-ach, running at the nose, a general drowsiness, and inclination to sleep: The patients on whom it has been properly employed enjoy a very good sleep after it. But when those symptoms increase, and the patient has restless nights, not much effect is to be expected from Galvanism. The diseases in which I have tried the action of this stimulus were topical, originating from debility attended with deficient irritability, or paralytic complaints. I selected in the beginning such cases for my experiments, that had hitherto frustrated all medical assistance, and where no harm could be done; but after I had found it to have, in general, no bad consequence on the constitution, I began to apply the Galvanism in other complaints. The diseases in which I think the application of Galvanism is attended with effect, are the following.

1. *Paralysis of the Extremities.* If the application of Galvanism is intended to be of any use in these complaints, the cause of the disease ought to be only partial in the nerves themselves, by their not having the proper degree of excitation. Paralysis therefore arising from mechanical causes, exostoses, contortions, and other lesions of the back bone, and pressure on the brain, are not comprehended within the action of the stimulus. A paralysis may have originated from apoplexy and a pressure on the brain, but the cause must have ceased in order to admit the application of Galvanism. It is sometimes extremely difficult to ascertain, whether in hemiplegies the primitive cause continues to act in the brain, or whether the paralysis only remained in consequence of the debility of the nerves, cessante causa; but we may expect success from Galvanism when life returns to any part of the deceased side; at all events the experiment will be quite harmless. In paralysis arising from gout and chronic rheumatism, the application of the Galvanic

Galvanic stimulus is properly indicated, particularly as it may be made to act also as a discutient and derivant, if it is conducted to blisters. The cause of paralysis from retrograde exanthemata must be first removed, before Galvanism is to be applied; but if the paralysis should remain, *sublata causa*, it is time to order the use of Galvanism.

2. *Weakness of Sight and Amaurosis.* The application of Galvanism takes place in any degree of the disease, but not every species of amaurosis is qualified for the proper application of the Galvanic agent; according to my observations, we may only expect success from it in that species which originates in a debility and paralysis of the optic nerve, attended with deficient irritability, or in indirect debility. The diagnosis of this particular state is not so easy as may be imagined; but to trace the cause of this disease is frequently attended with great difficulties, though they are chiefly capable of throwing light on the true nature of the disease. Any cause which debilitates the whole nervous system, and consequently the optic nerve, or which immediately diminishes the excitability of the eye, viz. too strong and lasting action of light on the eye, previous inflammations of the eyes, excessive use of the eyes, particularly in microscopical observations, action of morbid stimuli on the eye, gout, retrograde exanthemata. This state is distinguished by the following criteria. 1. When the sight of the patient gets better, after he has taken a meal and drank some wine, than when he is fasting. 2. When he looks better after a walk. 3. When his sight is improved in strong sun-light. 4. When the application of external strong exciting remedies, as spirit sal. ammoniac, has a favourable effect.

In that species of amaurosis, however, in which the debility and paralysis of the optic nerve are united with increased excitability, I am induced to dissuade the application of Galvanism. The patient sees better in this case when the light is moderate; his eyes are very sensible and become painful by the least effort; sometimes he can hardly bear light at all, and the eyes water. Although Dr. Augustin likewise recommends the use of Galvanism in this case, advising to begin with a few strata according to the Brunonian table, I have always observed by my experiments, that it is not only of no effect, but also is certainly prejudicial to the cure. It seems as if, in this case, another stimulus acted, producing together with debility a certain degree of excitement, which never admits the application of exciting remedies. I have at least successfully employed here gently and permanently strengthening, opiate, and derivant remedies, viz. acids with opium, narcotic remedies, extractum hyosciami,

hyosciami, &c. Galvanism is still less applicable in the amaurosis which arises from the accumulation of blood, and from the distension of the blood vessels near the optic nerve, or on the retina; a morbid state, which is frequently occasioned by suppressed menses or hæmorrhoids. The amaurosis caused by impurities of the primæ viæ, retrograde gout, rheumatisms, and exanthemata, are likewise not fit for the application of Galvanism, as long as those causes continue to act; but when amaurosis remains after their having ceased, we may employ it with hopes of success.

In the amaurosis produced by violent commotions of the eye, I should likewise think it of use; but not much is to be expected in that singular species of amaurosis, which is occasioned by wounds of the eye-brows in the region where the frontal nerve issues, and particularly by their subsequent cicatrization.

3. *Difficulty of Hearing, and Deafness.* What has been stated of amaurosis likewise takes place in the affections of hearing, particularly that we cannot expect advantages in all species of deafness from the application of Galvanism, but only in such, in which the proximate cause consists in a debility and paralysis of the acoustic nerve, attended with deficient excitability. All causes therefore, which by too vehement irritation have produced an indirect asthenia in the organs of hearing; too violent sounds, previous inflammations of the meatus auditorius, typhus, &c. constitute that state of deafness in which the application of Galvanism may be used. The criteria of this state are the following. 1. The disease diminishes or increases according to the different degree of excitement of the patient, and according to the general state of health, of weather, and time of day. 2. The patient hears better when he is in good health, and in a proper degree of excitement, after a meal and in agreeable company, and when he is in good spirits. 3. Dry and clear weather improves his hearing. 4. He hears better at night than in the morning; and when he has quietly and well rested, worse than after a restless night. 5. He hears more distinctly when there is much and loud noise about him.

EXPLANATION of TABLE II.

Fig. 1. A machine for fastening the conductors in the ears, by which the conductors can be turned in all directions. It consists of a hoop of whalebone, *a b*, which is fastened to a strap of leather, taffety or velvet, which can be buckled round the head, *c, c, c*. From each end of that hoop an arm of brass with double joints, ending in a case, in which a glass pillar, *g, h*, moves up and down; at the end of the glass pillar is another case, *k*, through which passes a glass tube with the conductor.

Fig. 2. This machine applied to the head of a person, after being brought in contact with the pile.

Fig. 3. A conducting plate from which the chains proceed.

Fig. 4, 5, and 6. The single parts of the above machine.

Observations

Observations on the Modus Operandi of Opium; communicated by Mr. WARD, of Manchester.

[Continued from Vol. VII. p. 497 — 506.]

IN my last paper I endeavoured to shew, that the *primary* effects resulting from the *internal* use of opium, upon which so much stress has been laid by the advocates for the *stimulant doctrine*, are not the consequence of its operating as a *stimulant*, as has been supposed, but of its operating directly as a sedative upon the vessels and coats of the stomach and small intestines, and in this manner retarding or interrupting THE NATURAL FUNCTIONS OF THESE IMPORTANT ORGANS; in other words, that it acts by diminishing the motions and powers of motion in the vessels, more especially of the arteries, of the villous and other coats of the stomach and bowels; the secretory vessels no longer pour out their accustomed quantity of juices; the absorbents and lacteals, as well as the muscular coats of the stomach, &c. are thrown into a comparatively quiescent state; the cravings of hunger are in consequence allayed; diseases depending on the natural functions being carried on with too much rapidity, or which are accompanied with irregular or spasmodic contractions of the muscular fibres of the alimentary canal, as vomiting, diarrhoea, tenesmus, &c. are alleviated; that the resistance which is opposed to the free passage of the blood through the branches of the arteria ventriculi coronaria, the pylorica, gastrica, and gastroepiploica, will occasion a greater determination of blood to the arteria hepatica and splenica* than they can immediately receive, (in the same manner as if a ligature were passed round the coronary and other arteries of the stomach) this will cause a degree of plethora in the aorta, which will soon extend to the heart, the pulmonary, subclavian, and carotid arteries, and be the means of increasing the frequency and strength of their contractions, and the usual concomitants of an accelerated circulation will ensue; and thus, in habits weakened by the excessive use of opium, an increase in the tone and vigour of the system is acquired, for a short time, (which could not have been brought about by any stimulant medicine, internally administered, because of the tendency which medicines

* Here we have another strong confirmation of the sedative theory (as well as an opportunity of observing its simplicity) in the frequent occurrence of hepatic and splenic inflammation, and the rare occurrence of gastric inflammation in those persons who fall a sacrifice to the immoderate use of opium; and if fermented liquors and spirits do not operate in the same manner as I am endeavouring to prove with respect to opium, how shall we explain their so constantly producing the same effects, when taken to excess?

medicines of this class have to empty, rather than to fill, the large arteries, by promoting, instead of retarding, the circulation in the smaller series of arteries both in the viscera and the extremities) a sensation of warmth is diffused through the system,* and the spirits are raised so as to render those who were before pale, dull and languid, lively and alert;† but the *delusion* can never be

* Several passages occur in the Inquiry which seem to imply that opium has the power of augmenting the heat of the body *beyond the healthy standard*, "With the increase of frequency of the pulse the heat of the body is generally somewhat augmented." p. 31. "With the increased frequency of pulse, the heat of the body is, as abovementioned, somewhat augmented, at least in all my experiments I found this to be the case, *if I could judge by my own feelings*, and it was sometimes attended with flushings of the face." p. 38. "In twenty minutes, my pulse was fuller as well as quicker; *the heat of my body was raised*." p. 66. "Taken internally it quickens and strengthens the contractions of the heart and arteries, *increases the heat of the body in general*." p. 169, 170.

It appears, however, from the experiments of Dr. Bard (who had recourse to a more certain test than the feelings, viz. a thermometer) *that it does not increase the heat of the body beyond 98*; (indeed, who ever saw the circulation so much accelerated by opium as to render such a circumstance probable?) but it is highly probable that a sense of coldness must often, (perhaps always) accompany the languor and depression of spirits which the lovers of opium complain of so heavily, except when they are under the *primary influence* of their morning or evening dose; and I have no doubt, was the experiment made, where so large a dose has been taken as to produce such a degree of languor as is here supposed (whether it may have accelerated the circulation *primarily* or not) that the heat would be found reduced much lower than at the commencement of the experiment; the same may also occur in a less degree, during that state of inactivity which is required in conducting such experiments as Dr. Crump was engaged in; and as opium accelerates the circulation primarily, under certain circumstances, as has been explained, and (*when it has that effect*) *raises the spirits (more or less in proportion to the degree of languor previously subsisting)* it must in these instances increase the heat of the body, *in some measure, so as to bring it nearer to the natural standard*.

"Sed ne longius auctores auctoribus opponam, opinionis utriusque veritatem, sequente experimento, detegere conatus sum. Per totum actionis opii stadium, in plerisque præcedentibus experimentis, thermometerum Fahrenheitiano simile, sub axilla subinde conclusi; quo licet per dimidium horæ retentum, nunquam argentum vivum ultra gradum 98um ascendebat, quanquam sani et ab opii potentia immunis, semper ad gradum 98um, et altius sæpe, eodem temporis spatio naturalis corporis nostri calor, mercurium excitare potest." Bard. *Dissertatio Inauguralis de Opio*, p. 25, 26.

Whoever will peruse Dr. Bard's Thesis, will find (notwithstanding the hasty manner in which it is passed over by Dr. Crump, see Inquiry, p. 36, 37,) that it contains many ingenious and valuable observations, equally creditable to the acuteness and candour of the author.

† Dr. Russell remarks in his History of Aleppo, that the use of opium is not so common among the Turks as is generally imagined, being chiefly confined to debauchees. The immediate effect I observed it to have, (says he)

be of long continuance, for in general by the time fifty or sixty minutes have elapsed,* the blood will also begin to stagnate *in the veins* of the stomach and other abdominal viscera, or a part of the opium will be conveyed by the lacteals or absorbents to the heart; and in either case (but especially if both these occurrences take place about the same time, which there is reason to believe often happens) a smaller quantity of blood will be sent to the right auricle of the heart, which will immediately take off the plethora, and reduce the frequency and strength of the pulse, (often considerably) below the natural standard; and now a degree of languor will be perceived and be more or less considerable in proportion to the want of vigour in the circulation, and will be accompanied by drowsiness, vertigo, pain in the head, nausea, tremors in the hands, &c.

The duration of these symptoms will depend upon circumstances. If only a moderate dose has been taken, the heart and brain will regain their irritability and mobility in a few hours, and

he) upon such as were addicted to its use, was, that their spirits were exhilarated, and from a dozing depressed state they became active and alert.

Chardin, in his Travels through Persia, and the Baron de Tott, in his Memoirs on the Turks and Tartars, speak of its exhilarating effects in still stronger language.

The former observes, that after the operation of this remedy, *the body grows cold, pensive, and heavy; and in this dull and indolent situation it remains till the dose is repeated.* He also tells us, that it is found by those who have a disposition for jesting to increase that extremely. In answer to which I must remark, that this property of *increasing habitual cheerfulness*, does not belong exclusively either to opium or to stimulants, the same effect being frequently observed to result from the exhibition of tonics, astringents, refrigerants, and even cathartics, *when their operation is salutary*; as must be well known to every man who has been long in practice. But in the instance of opium, I apprehend it must often be attributed to its *inebriating properties*.

"The Persians say, it entertains their fancies with pleasant visions and a kind of rapture; they very soon grow merry, then burst into a laugh, which continues TILL THEY DIE AWAY IN A SWOON." He had before said, that they accustom themselves to its effects, by beginning with a small quantity, and increasing it gradually; and he adds, when a Persian finds himself in a distressed situation, he has recourse to a piece of opium *as big as his thumb*, and immediately after taking this he drinks a glass of vinegar; this throws him into a fit of laughter, *which terminates in death*.

* Only forty minutes had elapsed in Dr. Crump's eighth experiment, when he "perceived a pleasing kind of languor gradually increasing," and the scale shews, that in forty-five minutes the frequency of the pulse was reduced from 70 to 64. In the 17th experiment, sixty minutes had elapsed when "a pleasing languor and drowsiness came on," but the pulse had sunk from 70 to 66 in forty-five minutes. In the 19th experiment, "in thirty-five minutes found a slight heaviness and pleasing languor coming on, the fulness of my pulse diminishing," and in fifty minutes the pulse was reduced from 72 to 68. Inquiry, p. 35, 65, 66.

and in proportion to the rapidity of this process, will they be restored to the vigorous exercise of their functions, when the languor, drowsiness, &c. will of course disappear; *this process however, will proceed much more slowly in the stomach and intestines, from the medicine having been applied to them in a more concentrated state than to the heart, &c. hence a much longer time will frequently elapse before they will be capable of performing their functions in a proper manner.*

It too frequently happens, however, (*much more so than we could have any idea of from the whole tenor of the Inquiry,**)
where

* "These experiments, and the authorities above quoted, seem sufficiently to evince, that the primary effect of opium on the pulse, is to accelerate and render it fuller; and we can only account for the mistake of those who maintain a contrary opinion, by supposing that they neglected to examine the state of the pulse *shortly* after the opium had been taken, attending only to the *ultimate* changes it underwent; and this supposition will receive further confirmation from considering, that the only favourer of this opinion, who, as far as I know, has given a particular detail of any experiments in its support, has totally omitted any account of the state of the pulse *during the first half hour*; (Bard Dissert. Inaug. de Opio, Edin. edit. an. 1763,) although, as sufficiently appears from those above related, its frequency is, during that period, more augmented than during any other, and indeed in a shorter time than has been generally imagined." Inquiry, p. 36, 37, and 192. It is true that Dr. Crump does once allude to its power of *immediately producing total insensibility, immobility, and loss of life, although no symptom of increased excitement precedes these effects*; (p. 193, 194) but it is rather as an exception to a general rule, than as a circumstance of frequent occurrence, *and he speedily and very prudently dismisses it, as being inconclusive and unimportant.*

There is one circumstance in the experiments of Drs. Crump and Bard, too remarkable to escape notice.

It appears that in *every experiment* made with opium, *taken internally, of which Dr. Crump has given an account*, the pulse very soon became more frequent, and continued so, (*eighty minutes in one of them, viz. the 7th*) *taking the average of the five experiments forty-eight minutes.* See Exp. 6, 7, 8, 17, and 19.

Dr. Bard made a similar experiment *fourteen times*; and it appears from two of them, which are minutely detailed, and from an extract which I shall make from his work, that he did not in any instance *delay examining the pulse longer than half an hour*, (indeed I think it reasonable to conclude from the tenor of his language, that in some of his experiments he did not delay the examination so long) *yet he never found its frequency increased except in one instance.*

I shall not attempt to explain this *physical prodigy*, farther than by observing that Dr. Bard's experiments bear evident marks of having been conducted with great circumspection and accuracy, *and there is no inconsistency, that I can perceive, in his arguments.*

"Hoc experimentum quater in meipso, pari cum successu, expertus sum. Pulsus scilicet diminutus, aliaque symptomata ordine semper redierunt.

"Pari modo, in amicorum tribus, et in sex convalescentibus nosocomii regii, ejusdem rei periculum feci, et semper iisdem phaenomenis redeuntibus.

Sed

where the dose is large, and the habit unaccustomed to opium, or there is a deficiency of vital energy in the frame, that it operates so instantaneously and powerfully as a sedative upon the sensibility, irritability, and mobility, of the veins as well as the arteries and other vessels belonging to the stomach and intestines, and also upon the lacteals and ducts which open into the *primæ viæ*; and its influence is so much more extensive than in the former case, as to occasion a considerable quantity of blood, which was returning to the vena cava inferior from the stomach, the intestines, the spleen, the pancreas, the mesentery, and more especially from the liver, by the hepatic veins, to be intercepted and detained in the veins belonging to the abdominal viscera; and one great source by which the heart is usually supplied with blood, being in this manner suddenly cut off, it will send out a smaller quantity at each contraction; and not being able, any more than the aorta and pulmonary arteries, immediately to adapt itself to the diminished quantity of blood, the latter will not be propelled with the same force as before, which will speedily retard, if not interrupt, the circulation not only in the minute vessels of the extremities (as we have seen exemplified in Dr. Alston's experiments) but in the whole arterial system; the venous circulation will also be carried on in a very languid manner; the processes of secretion and excretion will cease almost universally; the skin will become cold, and lose its colour; the pulse and respiration will be scarcely perceptible; the pupils will be dilated; stimulants applied to the organs of sense will produce little or no sensible effect. If the vital functions continue long in this state of suspension, all attempts to restore them will be ineffectual, (the natural functions may be suspended for a much longer time without death ensuing) and the patient will expire without a groan or a struggle; (to adopt the words of Chardin, *he will die away in a swoon*. Inq. p. 50) But if they have not been entirely suspended, or have remained only a very short time in that state, and a rational mode of treatment is adopted, the recovery will often be complete.*

But

Sed quoniam iis continuo invigilare non poteram, omnia quæ iis contigerunt, sigillatim enarrare inutile judicavi; in omnibus tamen pulsus ab initio opii actionis tardiores factos deprehendi. Aliarum in meipso tamen semel factum fateor; cum enim opii grana duo cum dimidio, devorassent; mox per horas duas vel tres, nausea et vomitu continuo laboravi: qua signorum violentia, etatique opii copia, nonnihil perterrita, mihi pulsus erant aliquanto citiores. Quod terrori, et vomitus convulsioni, potius quam alicui opii stimulo tribuendum censeo; nam in omnibus, et ante et postea institutis, experimentis, pulsus protinus ab initio nunquam non tardati sunt." Bard, de Viribus Opii, p. 17, 18.

* By a rational mode of treatment, I mean such a one as it would be ridiculous to think of, if opium were a stimulant; but this is a subject too extensive

But there is a considerable variety in the symptoms in different persons, even in the case now supposed, as appears from the view taken in my last paper. In many instances the stupor is accompanied by partial or general spasms, laborious breathing, &c. &c.* all depending upon and easily traced to, a powerful and directly sedative cause, operating unequally and irregularly upon the irritability and mobility of the vascular and nervous systems.

In treating of the exhilarating properties of opium, I have not enumerated all the instances in which it manifests such a power; nor was it necessary, because I apprehend *the same general principles are applicable to every case and circumstance whatever, so as entirely to remove every thing ambiguous and obscure, relating to its mode of operating.*

Were an impartial observer to take a view of the experiments which have been brought forward in the course of this Essay, he would naturally be desirous to know the *origin* of the stimulant doctrine, which he must pronounce to be very inconsistent and extraordinary. Dr. Crump has given us some information on this point.

“Galen,

extensive and important to be comprised in a Note, I shall therefore decline entering upon it at present. A very instructive case is related in the Medical Observations and Inquiries, vol. vi. p. 331, and another in Johnstone's Medical Essays, p. 168. Fortunately they fell into the hands of men who were aware of the absurdity of that doctrine, which would represent opium as operating by a stimulant power. Indeed, when I reflect how widely the unfounded and pernicious doctrine just alluded to, has spread, what general acceptance it is in, (as appears from almost every modern medical publication) and that there is too much reason to apprehend it may become still more prevalent, having received the sanction of a late celebrated writer, I am at a loss in what terms to express my anxiety for the fatal consequences which cannot but ensue.

The Author of a communication “on the use of opium in fever,” in the 41st number of the Medical and Physical Journal, seems to have entirely mistaken my meaning; (unless he meant to speak ironically in his note to p. 51, where he thanks me for the pleasure he has received from the perusal of what he is pleased to term, my *excellent* Dissertation on Opium) for if there be any truth in my theory, the opinions held out in his communication are the most injudicious imaginable; and I console myself with the reflection, that I have not written a sentence which could be supposed even to countenance, much less to recommend, a practice at all similar to that which he inculcates. Thus much I thought it incumbent upon me to say, to prevent any misconception which might otherwise go forth.

* “The mind becomes gradually dull and languid, the body averse to motion, little affected by customary impressions, and inclined to sleep. If the dose has been considerable, all these symptoms continue to increase; and tremors, convulsions, vertigo, stupor, insensibility, and deprivation of muscular action, appear variously complicated, and in various degrees, proportioned to the excess in the dose, and peculiarity of constitution in the sufferer.” Inq. p. 44.

"Galen, who seems to have been the first to exhibit opium, though with a sparing and timorous hand, attempted, on those principles by which he was apparently led in his reasonings in other instances, to explain its wonderful, and seemingly deleterious properties."

Medicines, it is known, he divided into *cold* and *hot*; and opium, he asserted, was cold in the fourth or greatest degree. The proofs he assigned in support of this assertion, seem, as far as they can be collected, to have been deduced from its power of inducing sleep, stupor, and other similar affections;* all of which, he asserted, were ever the consequences of the exhibition of cold bodies; and from the nature of those substances which he deemed necessary to be joined with opium in order to correct the supposed intensity of its frigidity; all of which substances he ranked in the class of hot medicines.

Long was the authority of Galen predominant in the schools, both among his cotemporaries, immediate successors, and the first professors of the healing art after the restoration of learning. With his other tenets, this mode of explaining the properties of opium was implicitly acceded to; and one principal consequence resulting therefrom was, that it was always necessary to exhibit with opium some medicines of a hot nature, to correct the intensity of that property by which it was supposed to act. To this circumstance do we owe those famous medicines, the Philonium, Theriaca, and Mithridate; so long from a veneration for antiquity retained, and at length so justly exploded.

As the *Chemists* were the first that openly opposed the authority of Galen and his commentators, so their opinions on many medical questions were nearly opposite. With respect to the nature and mode of action of opium they were diametrically so; for though Galen had placed it amongst the coldest bodies known, the new sect asserted it was of a hot nature, and that all its effects were to be attributed to its *heating properties* alone. These positions they supported by arguments drawn from its *ostensible qualities*, as its *smell*, *bitter taste*, *inflammability*, &c. from many of its effects on the human body, as its *exciting heat*, *thirst*, and *itching*, *intoxication*, and other effects always consequent to the exhibition of medicines of a hot nature.

Such were the opposite opinions avowed and supported by these two contending sects, while they continued to divide the medical

* This opinion of Galen, notwithstanding the vague and complex practice to which it gave rise, appears to have been better founded than has been imagined.

medical world. Many, however, were not wanting who steered a middle course, asserting that opium was composed of particles in their nature different, some possessing a hot, and others a cold quality; that the cold were more in number than the hot, and that, in consequence of this composition, the effects which were to be attributed to the hot particles were slight and transient; and those produced by the cold, violent and permanent." Inq. p. 89—92.

I shall now pass on to p. 97, where the following remarks occur.

"By far the greater number of modern authors seem inclined to attribute the effects of opium to its action on the nerves; on which it is generally said to exert an immediate *sedative* power; without its being specified in what particular manner this sedative quality acts; Dr. Cullen, indeed, and others going so far as to say, that sedative powers produce their effects by destroying the *mobility* of the nervous fluid. Yet, as among others, many effects are observable from the action of opium, which are by all attributed to bodies termed *stimulant*; many of these authors are inclined to attribute to it a stimulant quality also, but of so slight and transient a nature, as to be soon overcome by its opposite, or the sedative power."

"The stimulant powers of opium are, indeed, in numerous instances, so remarkable, that we find many writers comparing its mode of action and effects to those of substances *universally reckoned powerful stimulants, as wine, alcohol, and the whole class of cordials*;* although its remarkable pre-eminence in allaying pain and irritation, and producing sleep, insensibility, &c. has induced them, when attempting to explain its action, to ascribe to it a direct and powerful sedative quality. *But the only writers or teachers, who, as far as I know, have expressly denied any direct sedative power in opium, and ascribed all its effects to its stimulant quality alone, are the late Dr. Brown, in his Elementa Medicinæ, Lectures, and other productions, and his Pupils.* Opium according to this Author, like every other medicine,

* This vague method of reasoning occurs very frequently in this and the succeeding Chapters, See p. 164, 5; 170, 171; 177; 195—202. It is exceedingly objectionable, as I have already endeavoured to shew (M. & P. J. v. vii. p. 127.) *It is not true that wine and alcohol are universally reckoned powerful stimulants*; (See Cull. Mat. Med. v. ii. p. 315—317,) and what is meant by the whole class of cordials?

Neither does it follow, because opium acts in the same manner as wine and alcohol, that it is therefore a stimulant. So loose a method of arguing would be rejected in discussing almost any other subject; and is not accuracy as much required (to say the least) in a physical discussion, as in any other?

medicine, acts primarily on the living principle, or, as he terms it, excitability of the system; *is possessed of a highly stimulant quality, and allays pain, induces sleep, intoxication, and other similar affections, BY THE EXCESS OF THIS POWER ALONE.* ITS REMARKABLE PRE-EMINENCE, HOWEVER, AS AN ANODYNE, OVER OTHER STIMULANTS, HE HAS NOT, AS FAR AS I CAN COLLECT, ATTEMPTED TO EXPLAIN." Inq. p. 97—99.

*This honour appears to have been reserved for Dr. Crump; and it will be very easy to shew, when I come to the arguments he brings forward in support of this preposterous notion, that he possessed a sufficient portion of zeal to qualify him for so extravagant a project.

Such was his ardour in the cause, that he has travelled (in idea) *nearly to the north pole* in search of arguments; (See p. 163—4) and *elucidates* his theory by what he calls a few *apposite* examples, deduced from *analogous* facts with respect to sensation.

These *apposite* examples consist in shewing the effects of exposing THE EYE TO VERY BRIGHT SUN SHINE, and suddenly removing the person who is the subject of the experiment *into a dark room*: 2dly, exposing the whole body, or any particular part of it, *to a high degree of heat, and suddenly reducing it 20 degrees.* (P. 189—90.)

Another of these *apposite* examples is to be met with, p. 164. "If the hand immersed in water of considerable warmth, be taken out and plunged in a vessel containing a quantity of the same fluid of a somewhat lower temperature, instead of the sense of heat which would have arisen, were it not for its previous application in a more considerable degree, that of cold will be the consequence."

Such bold flights may shew the ingenuity of the author, and may deceive by their speciousness, but will not bear the test of sober inquiry.

"Another opinion which remains to be mentioned, is that lately advanced by the Abbe Fontana. From a number of experiments made with opium on different animals, he positively asserts that it has no action whatever on the nervous system, or vital solids; and that all its effects are to be attributed to changes induced by it on the blood. The particular nature, however, of these changes, he appears neither to attempt to specify, nor to answer the many objections urged by preceding writers against explanations of a similar kind."

"Such appear to have been the principal theories which have prevailed on the subject we are engaged in; and, though each in turn has had its numerous advocates, we find many physicians

cians so far dissatisfied with the explanations resulting from them, as ever to be ready in acknowledging their ignorance with respect to its real operation, and willing to attribute the effects it produced to some peculiar and undiscovered properties; and, notwithstanding an explanation of its action has been attempted by a considerable proportion of the many medical writers who have flourished since the very first ages of the science, as appears from the preceding part of this chapter; yet it will be sufficiently evident, from a little consideration, that the seeming variety of opinions on the subject, however apparently different, may be reduced, with propriety, to three classes only. The first, containing the opinions of those who ascribe its effects to changes induced by it in the blood. The second, of those who deduce them from its action on the living principle as a sedative, or sedative and stimulant conjoined. And the third, comprehending the sentiments of such as attribute to it the properties of a stimulant alone."

"For in what material circumstance do the disputes, with respect to its *hot* and *stimulant*, its *cold* and *sedative* qualities, materially differ? Are not the sentiments of many moderns, who deem it possessed of both a stimulant and sedative power, similar to those of more ancient physicians, who assigned to it hot and cold qualities in different proportions? And will not a little attention sufficiently evince, that the mechanical conjectures of many, as to the particular manner in which it was supposed to obstruct the nervous canals and motions of the animal spirits, do not vary essentially from the sentiments of those moderns, by whom its sedative effects are ascribed to a diminished mobility of the nervous fluid?" Inq. p. 99—102.

The above extracts shew the situation of the controversy at the time Dr. Crump entered upon it.

Chapter V. is occupied in refuting the opinions of those who ascribe the operations of opium to changes induced by it in the fluids, and in considering the arguments adduced to prove that the nervous system is insensible to the operation of opium, and the blood alone liable to its action: opinions so ill founded as scarcely to have merited a serious refutation.

In the VIth Chapter, Dr. Crump enters into an examination of the different theories which have been advanced to explain the phenomena arising from the exercise of the nervous functions.

I have very few observations to make upon this part of the Inquiry. For a more copious account, see p. 144—153.

"From the first commencement of any controversy upon this subject, the prevailing opinion seems to have been, that the immediate agent in all the nervous or animal functions was a peculiar

a peculiar fluid secreted into, and freely flowing through the cavities, or inherent in the substance, of the nervous fibres. This precedence it still retains, and, as the only explanation at present offered, seems alone to merit a particular discussion. To me I must confess, it appears no better founded than any other advanced upon the subject, and I shall briefly state the reasons which have induced me to form this opinion." P. 143.

Here I entirely coincide with Dr. Crump. Indeed, as no appearance of a cavity is discoverable in the nerves, even with the aid of a microscope, one would imagine there could scarcely be two opinions on the subject.

Besides, supposing the theory of a nervous fluid to be just, it would still be imperfect, as appears from what follows.

"This structure is surely incompatible with the opinion of sensation being occasioned by the nervous fluid moving towards the brain, and muscular actions depending on its motions from it; both functions are frequently exercised together, and we can hardly suppose that a fluid moves at one and the same time through a long, extremely minute, and variously infected cavity, in opposite directions, without irregularity or confusion. If the nerve which supplies any particular limb or muscle, be divided and pressed between the fingers from its insertion in the muscle towards its divided extremity, the fibres it supplies, as I have myself often experienced, will be thrown into convulsive actions; but if the action of a muscle be the consequence of the nervous fluid's being urged in unusual quantity into its fibres, we can hardly suppose that such effects would follow from an experiment, whose only tendency, did such a fluid exist, would be to move it in an opposite direction. Similar convulsive actions will ensue, if the nerve of any muscular part be irritated by a sharp and penetrating instrument." Inq. p. 149—151.

But I am by no means satisfied with the hasty manner in which Dr. Crump has dismissed the theory of vibration. He merely tells us, that the hypothesis has been refuted by very sufficient and convincing arguments, and that it seems at present to be *universally* deserted.

They must have more faith, however, in Dr. Crump's decisions than falls to my share, who can rest satisfied with the information here afforded.

Whatever may be the nature or essence of the nervous power, every experiment hitherto made on the inferior animals, at least every one I have met with) shews, that it is so much diminished by a moderate dose of opium, that the nerves are with difficulty made to obey a stimulus; and the effect is the same, as far as its influence extends, to whatever part of the body the application is made,

made, (except it be to the nerves themselves :) but is most general and apparent when injected into the stomach of the animal: and that it is so immediately and completely destroyed by a large dose, that the nerves, as well as the muscular fibres connected with them, become totally insensible to every kind of stimulus; NOR IS THIS EFFECT PRECEDED, IN EITHER CASE, BY ANY SYMPTOM OF INCREASED EXCITEMENT, which it ought to be, were opium a stimulant.

I shall not stop, now, to inquire into the merits or demerits of Dr. Crump's theoretical reasonings, which occur next in order; but shall pass on to his conclusions. P. 191—193.

“To render my sentiments upon this subject as perspicuous as possible, I shall next endeavour to bring them under one clear point of view, by reducing the whole of the conclusions to be deduced from the preceding facts and arguments, to a few general heads; and the following appear to me to comprehend them all.

1. Opium is a medicine endowed with a stimulant property, considerable in degree, readily diffusible over the whole system, and easily and suddenly exhausted.

2. In consequence of the immediate operation of this stimulant power, the pulsations of the heart and arteries are rendered quicker and stronger; the heat of the body is augmented, its perspiration promoted, sweating sometimes excited, the mind exhilarated, the delirium of intoxication (if the medicine be taken in sufficient quantity) induced, such morbid symptoms as arise from general debility removed, and the excitement, in short, of the whole system increased.

3. But this stimulant power being suddenly exhausted, the system at large is left insensible, in a great degree, to the operation of every exciting cause; and as those continuing to act are generally inferior in point of exciting force to that which the system was so suddenly deprived of, their effects are rendered less considerable than before its operation: hence the pulsations of the heart and arteries become slower; pain and inordinate action, as arising either from a morbidly acute degree of sensibility, or the presence of irritating powers, are alleviated or totally removed; watchfulness, as produced by similar causes, prevented or suppressed; the mind is rendered dull and languid; and if the dose has been considerable, INDIRECT DEBILITY succeeds; stupor, tremors, and other similar symptoms ensue; the pulse intermits, AND DEATH perhaps concludes the scene.”

These conclusions are immediately succeeded by the following remarks, which plainly shew, that Dr. Crump's mind was so completely

pletely biassed by prejudice, as to have disqualified him for the investigation of physical truths*.

“ With respect to the objections which may be made to this explanation of the properties of opium, the only one which can, as appears to me, be urged against it, and which has not been answered, is that founded on AN UNCONTROVERTIBLE FACT, viz. that opium applied to different parts of living animals, is IMMEDIATELY productive of TOTAL INSENSIBILITY, IMMOBILITY, AND LOSS OF LIFE, ALTHOUGH NO SYMPTOM OF INCREASED EXCITEMENT PRECEDES THESE EFFECTS†. It has thence been concluded, that the medicine operates in every instance by a directly sedative quality; and as it is the principal argument relied on in attempting to prove this opinion, and may be adduced against those in this chapter adopted, I have considered it with particular attention, BUT FIND IT NOT POSSESSED OF ANY FORCE, NOR IN THE LEAST DEGREE CONCLUSIVE; AND FOR ONE simple, BUT VERY SUFFICIENT REASON, WHICH IS, THAT MANY OTHER ARTICLES, universally ACKNOWLEDGED TO BE ENDOWED solely WITH A STIMULANT PROPERTY, ARE PRODUCTIVE, IN SIMILAR CIRCUMSTANCES, OF THOSE EFFECTS WHICH, WHEN INDUCED BY OPIUM, ARE RECKONED THE CONSEQUENCES OF A DIRECTLY SEDATIVE QUALITY ALONE. A few of the experiments I made with a view of determining this point, it may not be amiss to state: They were indeed among the first I instituted on the subject, at a time when I was engaged in considering the validity of the usual arguments advanced in support of the generally received opinion with respect to the sedative qualities of the medicine. THE STIMULANTS I EMPLOYED WERE, RECTIFIED SPIRIT OF WINE, THE VOLATILE ALKALI, AND ELECTRICITY, THREE OF THE MOST

* “ Of the numbers employed in the pursuit or practice of Medicine, (says Dr. Crump, Introduction, p. 3, 4.) a great part must, of course, be deficient in the strength and acuteness of genius necessary to decide with propriety between a diversity of opinions: SUCH HAVE ALWAYS BEEN INVINCIBLY PREPOSSESSED IN FAVOUR OF IDEAS FIRST IMBIBED, &c.”

† Here Dr. Crump acknowledges that his theory is at variance with an uncontrovertible fact; one too of frequent occurrence. (See his 12th, 10th, 32d, 40th, and 42d experiments.—Supplement to Fontana’s Treatise on Poison.—Wilson on Opium.—Alexander, Dissert. inaug. de partibus corporis animalis quæ viribus opii parent.) and uncommon importance, AND WHICH IS DECISIVE IN PROVING THE STIMULANT THEORY TO BE FALLACIOUS AND UNTENABLE; but rather than abandon it, which it is evident he must have done, had the discovery of truth been his chief object, he had recourse to the only remaining expedient—evasion.

POWERFUL *we ARE ACQUAINTED WITH**; and my intentions at the time were to determine whether, when applied to animals in a similar manner with opium, THEY WERE NOT EQUALLY EFFICACIOUS IN DESTROYING ALL ACTIVITY AND SENSIBILITY."—Inq. p. 193—5.

Here Dr. Crump evidently shifts his ground, and the question is no longer whether opium acts as a stimulant or a sedative; but whether OTHER ARTICLES, which he enumerates, and which he says, (with what truth will appear by referring to Cullen's Mat. Med. vol. ii. p. 315. 317) are universally acknowledged to be endowed SOLELY with a stimulant property; are not equally as efficacious as opium, IN DESTROYING ALL ACTIVITY AND SENSIBILITY.

This had been proved, by experiments conducted upon a much more elaborate plan than those of Dr. C. long before his publication appeared†; but so far is this circumstance from proving opium to be a stimulant, that it establishes, beyond a controversy, A POSITION EXACTLY THE REVERSE; viz. THAT NOT ONLY OPIUM, BUT ALSO SPIRIT OF WINE, VOLATILE ALKALI, AND STRONG SHOCKS OF ELECTRICITY, ACT DIRECTLY AS SEDATIVES‡.

The experiments alluded to in the passage just quoted, are as follow:

Expt. 32. "Having separated by inflation, the skin and muscles of one of the posterior extremities of a frog, I poured between them some of a strong watery solution of opium. THE LIMB WAS DEPRIVED OF ALL SENSIBILITY AND POWER OF MOTION in ten minutes."

* This is a declaration which I sincerely hope, none but a disciple of the Brunonian school could have made. They certainly act very powerfully; but not as stimulants, as will be seen by and by.

† Essays and Observations Physf. et Lit. vol. iii. p. 340—358.—Fontana on Poisons, Supplement, vol. ii.—Alexander, Dissert. Inaug. de Opio.

‡ To the same class undoubtedly belong THE VENOM OF THE VIPER, THE TICUNAS, AND THE CHERRY LAUREL. From an attentive examination of the experiments made by the illustrious Fontana with these poisons, and comparing them with the experiments made by himself (see his Supplement) and others, with opium, spirit of wine, &c. I am fully persuaded (and whoever will investigate the matter with a mind free from prejudice, will, I think, be of the same opinion) THAT THEIR MODUS OPERANDI IS DIRECTLY AND POWERFULLY SEDATIVE; but I am under the necessity of deferring the farther consideration of this important subject, together with the mode of treatment, which this idea of their manner of operating suggests, to another Number of the Medical and Physical Journal; when I hope to shew, in a tolerably satisfactory manner, that the numerous experiments made by this truly great philosopher, may possibly at length, in some degree, answer the purpose intended by their benevolent author.

Expt. 33. "Between the skin and muscles of the posterior extremity of another, I poured a quantity of *spirit of hartshorn*, which was productive of the same effects as opium in the former experiment in about ONE minute."

Expt. 34. "Employing RECTIFIED SPIRIT OF WINE in the same manner as the other articles in the two preceding experiments, I found it succeeded*, by similar consequences, in THREE minutes."

Expt. 35. "A SMART SHOCK OF ELECTRICITY having been passed through the hind leg of another frog, IT INSTANTLY RENDERED IT COMPLETELY PARALYTIC."

Expt. 36. "Having taken out the heart of a frog, and immersed it in some of the same solution of opium employed in Experiment 32, I FOUND IT DEPRIVE IT OF ALL POWER OF CONTRACTION in TEN minutes."

Expt. 37. "The heart of another, immersed in *spirit of hartshorn*, WAS REDUCED TO A SIMILAR STATE in TWO minutes."

Expt. 38. "RECTIFIED SPIRIT OF WINE DEPRIVED A THIRD OF ALL POWER OF MOTION IN THREE MINUTES."

Expt. 39. "Having perforated a piece of common pane glass with a small hole, I laid over it the heart of a frog, and through it sent A SMART SHOCK of Electricity, WHICH INSTANTLY DEPRIVED IT OF ITS CONTRACTILE POWERS. I took the precaution of using the perforated glass, as I found the electric fluid was otherwise liable to glide over the surface of the heart, probably from its moisture, without affecting it in any considerable degree."

I must observe, however, that the shocks I employed were not so vehement as to injure the organic structure of the parts on which these experiments were made."

"The preceding Experiments, which I have frequently repeated, but with so little variation that a particular account seems not requisite, sufficiently shew, that three of the MOST POWERFUL STIMULI we ARE ACQUAINTED WITH ARE CAPABLE OF PRODUCING THOSE EFFECTS ON THE PARTS TO WHICH THEY ARE IMMEDIATELY APPLIED, WHICH, WHEN INDUCED BY OPIUM, WERE DEEMED THE CONSEQUENCES OF ITS SEDATIVE POWER; NAY, THAT THEY ARE PRODUCTIVE OF THESE EFFECTS EVEN MORE SPEEDILY THAN OPIUM ITSELF; AND IT CONSEQUENTLY APPEARS, THAT ANY ARGUMENTS DEDUCED FROM THESE OR SIMILAR FACTS, WITH AN INTENTION OF PROVING THE EXISTENCE OF THAT SEDATIVE QUALITY, IS INCONCLU-

* In depriving the limb of all sensibility and power of motion.

SIVE*. With a view of comparing *the effects of these stimuli upon the heart*, the following experiments were made."

Expt. 40. "Having extended the limbs, and tied down a large frog upon its back, I opened the thorax just so as to bring the heart into view; its pulsations were 62 in a minute. I then injected into the anus, by means of a small syringe, *some rectified spirit of wine*; but the quantity of which could not be exactly determined, as some of what had been injected was again discharged. Leaving the animal in this situation, I attended to the changes induced in the heart's motions; and reckoning its pulses at the periods mentioned in the first line of the following table, found their number to be as is set down in the second:

In	2	5	10	15	20	25	30	35	40	45	50	55	60	minutes
The P. was	62	62	62	52	46	44	42	40	38	36	34	32	32	

Sixty minutes elapsed, the animal was, in external appearance, dead, although the heart still continued to beat, and was thrown out.

Expt. 41. "Having tied down a frog, as in the former Experiment, brought its heart into view, whose pulse was 50 in a minute, and injected *some spirits of hartshorn*, I found it affected in the following manner:

In	5	10	15	20	25	30	minutes
The Pulse was	50	30	22	6	5	3	

Expt. 42. "Into a third, whose pulse was 58 in a minute, I injected *some of a watery solution of opium*, and found it affect the pulse in the following order:

In	2	5	10	15	20	25	35	40	45	50	55	60	minutes
The P. was	56	50	46	38	37	35	34	32	32	32	32	32	

The animal was still possessed of some power of motion and sensibility, but in so trifling a degree that he was killed and thrown out.

* There never was, perhaps, a stronger proof of inconsistency and absurdity than this inference exhibits. Indeed, had Dr. C.'s mental faculties been as much under the influence of *these powerful stimuli, as he calls them*, as the bodies and limbs of the frogs used in the last eight, and in the three following experiments, *they could not, apparently, have been more completely deprived of their sensibility and energy.*

Expt. 43. "Having tied down a frog and brought the heart into view, whose pulsations were 70 in a minute, I passed a smart shock of Electricity through the whole body from its head to its lower extremities. The pulsations of the heart INSTANTLY ceased, and it contracted but once when irritated with a needle. Leaving the animal in that situation, I observed, that in about five minutes, the heart began again to beat, FIRST SLOWLY, BUT WITH INCREASING CELERITY, till its pulsations rose to 35 in a minute. As they did not increase above this number, I gave another shock similar to the first, which was IMMEDIATELY productive of like effects; and after eight minutes more had elapsed, I could not perceive the smallest sign of returning pulsation. I then began to draw THE GENTLEST SPARKS from the heart, and was surprised to perceive it again begin to move; and its contractions, by continuing this application, INCREASED GRADUALLY, TILL THEY AMOUNTED TO 31 IN A MINUTE; when giving the animal a third shock, it entirely deprived it of life, for no farther application of any kind could rouse its heart into the smallest motion." Inq. p. 195—201.

All writers of credit, however they may differ in other respects, agree in defining stimulants to be such articles as INCREASE the animal energy*; and Dr. Crump evidently subscribes to this definition†. The most powerful stimulants might therefore be expected to increase the motions and powers of motion, either generally or partially, according to the manner of applying them, pretty considerably. We may therefore conclude, that if opium, spirit of wine, spirit of hartshorn, AND STRONG SHOCKS OF ELECTRICITY, are stimulants of the most powerful kind, as Dr. Crump asserts, he must have applied them improperly; for it appears from five of his Experiments (the 12th, 32d, 33d, 34th, and 35th,) that the part to which they were applied, WAS ALMOST IMMEDIATELY DEPRIVED OF ITS SENSIBILITY AND MOBILITY, AND WAS THE ONLY PART OF THE BODY THE ANIMAL WAS UNABLE TO MOVE. They had a similar effect upon the hearts of frogs separated from the body in Experiment 30, 36, 37, 38, and 39; and where they were applied so as to affect the system generally, as in Experiments 40, 41, 42, and 43: THE FIRST ALTERATION WAS A DIMINUTION IN THE FREQUENCY OF THE PULSE, which became slower and slower, TILL THE ANIMALS WERE REDUCED TO A STATE

* Culs. Mat. Med. vol. i. p. 187; vol. ii. p. 131, 132.—Brown's Elements, vol. i. p. 6.—Darwin's Zoonomia, vol. i. p. 13. 30. 73 and 74.

† See Inq. p. 160, 161. 169, 170. 184, 185.

OF INSENSIBILITY AND IMMOBILITY; to which state they were brought in a fourth part of the time they would have been, had their heads been cut off, and the spinal marrow destroyed*; and I do not suppose any one will assert, that decollation acts as a stimulant; and yet it acts in the same manner as the articles above enumerated, in immediately diminishing, and ultimately destroying, the sensibility, irritability, and mobility of the body.

That these reflections did not occur to Dr. Crump, is easily accounted for, from his being so strongly attached to preconceived ideas.

He is peculiarly unfortunate in his concluding remarks, p. 201—206.

“From the first Experiments related in this chapter, it appears, that spirit of wine, and the volatile alkali, DESTROY even more speedily than opium, THE MOBILITY AND SENSIBILITY OF THE PARTS TO WHICH THEY ARE IMMEDIATELY APPLIED. The succeeding Experiments shew, that although opium, from its more ready diffusibility, affects the pulse sooner than either of them†; yet that they at length are productive of similar effects, if applied in considerable quantity; and that the most powerful stimuli ‡, if applied to the human frame in immoderate doses, are, as well as opium, capable of inducing stupor, insensibility, slowness of pulse, and other similar affections, is evident, from many cases in which an immoderate quantity of spirituous liquors have been taken at once, and which have frequently terminated in death, preceded by those symptoms which an over dose of opium is generally productive of.”

* Ess. and Obs. P. and L. v. ii. p. 308. 311, 312, and vol. iii. p. 297. *Pugnat sententia secum*, (the phrase made use of by Dr. Crump, p. 125, in reviewing Dr. Corrie's Essay on the Vitality of the Blood, may be applied with propriety to many parts of the Inquiry: On the present occasion it is peculiarly applicable.

† Compare Expts. 40, 41, 42.

‡ Those articles which Dr. Crump, in defiance of reason and probability, so often calls by this name, do not act as stimulants; BUT DIRECTLY AS SEDATIVES: See his 12th, 30th, 31st, 32d, 33d, 34th, 35th, 36th, 37th, 38th, 39th, 40th, 41st, 42d, and 43d experiments. Dr. Monro has proved, by experiments upon frogs, THAT BRANDY, AND ALSO CAMPHIRE, ACT DIRECTLY AS SEDATIVES.—Essays and Obs. Physf. and Lit. vol. iii. p. 340—358; and Dr. Cullen has shewn, by the most uncontrovertible arguments, as well as by indisputable facts, that they operate in the same manner UPON THE HUMAN SUBJECT—Mat. Med. v. ii. Art. Sedantia. It appears also from Fontana's experiments upon guinea pigs, turtles, frogs, and leeches, (which were published before Dr. Crump's) that spirit of wine acts directly and powerfully as a sedative.—See his Supplement; and the same fact is also proved by Dr. Alexander's experiments upon frogs and dogs. Dissert. Inaug. de Opio.

“The

The only other fact I shall consider, as demonstrating that the same substance, which in a moderate quantity is capable of exciting the living principle of animals, will, if exhibited in an over proportion, totally destroy their excitability, is the well known property which Electricity possesses of inducing paralytic affections if applied in extremely violent shocks, and of removing the very same complaints if employed in more moderate proportion. This is particularly illustrated by a fact noticed by Fontana, and further confirmed by the experiment above related.—“Electricity,” says he, “induces death by destroying the irritability of the heart and muscular fibres; and yet this same Electricity is, notwithstanding, one of the strongest stimulants to the muscular fibres that is known. It restores life by exciting irritability, in the very animals in which it had, an instant before, destroyed it. Amongst all the stimulants that can be employed to call the animals back to life, that the electrical shock has thrown into a state of insensibility, a proper application of gentle sparks appears to me the most efficacious remedy.”—Skinner’s Translation, vol. i. p. 96.

It is evident both from the observations of Fontana, and from Dr. Crump’s 43d experiment, that violent shocks of Electricity directly diminish and destroy the animal energy, and that gentle sparks revive and increase it, or, in other words, that electricity may be so applied as to be made to act either as a sedative or a stimulant; but it remains to be proved that any of those medicines which Dr. Crump styles powerful stimuli, can be so applied as to be made to produce these contrary effects.

It appears, indeed, from a great number as well as from a great variety of experiments, that in whatever proportion opium is applied to the bodies of animals, THE EFFECTS ARE THE SAME IN KIND, DIFFERING ONLY IN DEGREE. A few examples may suffice.

Dr. Monro first poured forty drops of a solution of opium under the skin of the left thigh and leg, in three frogs. He did not attend to the effects till half an hour after, when he found that whole member paralytic, its toes and skin having lost their sensibility, and the muscles their motion. The animal seemed much stupified, and could scarcely move its body by the help of the other hind extremity; and the blood had ceased from motion in the small vessels of both feet, though, on examining the heart, he found it still gave 22 regular but feeble strokes in the minute. In ten minutes more, the animal became convulsed and died.

(TWO TRIALS.)

Dr. M. then tried the same experiment with twenty drops only of the solution; and observed, that in about a quarter of an hour that extremity was much weakened and less sensible, and

in five minutes more was not only motionless and insensible, but the animal seemed to be much stupified and lay still, unless when it was hurt; and after nearly the same time as those above, became convulsed and expired.

(TWO TRIALS.)

After that, he tried the same experiment with *ten drops only*. After twenty minutes that leg seemed to be weaker, and in ten minutes more its muscles lost their power, and the toes had little sensibility; and now the animal seemed to be a good deal stupified, and the heart of one of them examined gave only 25 strokes in a minute. An hour and a half after the beginning of the experiment, the toes seemed to have quite lost their sensibility, and the muscles their motion; but the other parts were not convulsed, and the animal jumped by the help of the other hind extremity. By degrees it recovered both sense and motion.

(TWO TRIALS.)

In the last place, Dr. M. poured *ten drops* under the skin of the thigh only in one frog, and the like quantity under the skin of the leg only in another, *without finding that either of these members lost their sense or motion, or that the rest of the body was observably affected*. Est. et Obs. P. et L. Vol. iii. p. 309—312. See also Med. and Phys. Journal, vol. vii. p. 350.

I shall transcribe Dr. Monro's first experiment with ARDENT SPIRITS, not because it is more important than the rest, but as being more adapted to the present purpose.

(FOUR TRIALS.)

"About seventy drops of a mixture of equal parts of WHITE WINE AND FRENCH BRANDY were applied on lint to the hind extremities of a frog. In seven minutes the animal was observably affected, AND ITS HEART BEAT ONLY FIFTY TIMES IN A MINUTE. In a quarter of an hour the heart beat only forty-five times in a minute; yet the rapidity of the blood in the hind feet was not very observably lessened. After twenty minutes the heart beat only forty times in a minute, and the creature was much stupified. After half an hour the heart beat only thirty-five times in a minute, and evidently with less force than natural; now the circulation was considerably less rapid in the vessels of the hind feet, and the creature was scarcely able to withdraw its legs when the toes were pinched. After three quarters of an hour the heart contracted but thirty times in a minute, and the motion of the blood in the vessels of the hind feet was extremely slow, and ceased altogether after fifty-five minutes; at which time the creature was unable to withdraw its legs from the most severe injury; or when the eye-ball was fretted with a probe, to shut its eyes, which were wide open; and its respiration had entirely ceased.

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I now removed the mixture and washed the legs in water; notwithstanding which it remained insensible for about an hour and a half longer, although the heart continued the whole time to vibrate, feebly indeed, about thirty times in a minute. But after this it began to bend the joints of the hind legs spontaneously; and in forty minutes more was able to scramble over the edge of the plate on which it was laid; yet, till half an hour after, when the heart contracted forty times in a minute, THE PROGRESSIVE MOTION OF THE BLOOD IN THE FEET WAS NOT RENEWED. Thus the animal gradually recovered its sensibility and motion, and the blood its free circulation; after three hours more, or about the end of the seventh hour from the experiment, it could jump with almost its wonted vigour, and the motion of the blood in the feet appeared free and rapid.

When the mixture was applied to one leg only, that leg seemed to be somewhat, but not very considerably, more benumbed than the other; yet the circulation did not cease sooner in the one than in the other leg." *Ess.* p. 340—342. Compare Dr. Alexander's 20th, 21st, 22d, 23d, 42d, and 43d experiments.—See also Willson on Opium, p. 92—3.

Dr. Crump permitted an excellent opportunity to escape, of ascertaining how far he was correct in supposing those substances which were employed in his 40th, 41st, and 42d experiments, viz. spirit of wine, spirit of hartshorn, and opium, to be endued with a power similar to that possessed by the electric fluid, of destroying the action of the heart when exhibited in an over proportion, and afterwards of exciting and increasing its action when applied in a moderate quantity; I mean, by injecting *after the heart had ceased to act*, a small quantity more sp. of wine, sp. of hartshorn, or of the solution of opium, in the gentlest manner, either per anum as before, or into the auricle or ventricle of the heart. But, indeed, the experiment might still be made. If it succeeds in restoring the action of the heart, which I believe few will expect, it will prove that these substances act either as sedatives or stimulants, according to circumstances, which Dr. Crump does not allow to be the case with regard to opium; (p. 167—169, &c. &c.) if it does not succeed, it will add another highly culpable instance of inaccuracy to those brought against Dr. C.

The sixth Chapter of the Inquiry concludes as follows:

"Having endeavoured to obviate such objections as may be urged against the explanation supported in the preceding pages, it may be deemed superfluous to attempt a further vindication of such an inquiry. But it has been by some remarked, that any investigation of the mode of action of medicines usually termed sedative is unnecessary; for that as they are only exhibited

bited with a view to their ultimate effect, it matters not in what manner these effects are brought about, or whether it be determined that they are the consequences of a preceding stimulant exertion or not."

Such I shall answer in the words of the immortal Bacon, by whom mankind, first extricated from the labyrinths of imagination, were conducted to the direct and only true paths to knowledge, and whose injunctions should be strictly followed in every scientific research. Hoc ipsum," says he, "*prius et posterius in omni actione naturali notare debet.*"* A caution to be especially kept in view where the primary action of a medicine is so obvious and important as that of opium; and the neglect of which is so strikingly censured, and its observance in every instance so strongly recommended by the same author in the following words: "Mira est hominum circa hanc rem indiligentia; contemplantur siquidem naturam tantummodo desultorie, et per periodos, et postquam corpora fuerint absoluta, et completa, et non in operatione sua. Quod si artificis alicujus ingenia et industriam explorare et contemplari quis cuperet, is non tantum materias rudes artis, atque deinde opera perfecta conspiciere desiderat, sed potius præsens esse, cum artifex operatur, et opus suum promovet: Atque simile quiddam circa naturam faciendum est."†

It will be unnecessary to enter into any further examination of Dr. Crump's *hypothetical reasonings*, since it must plainly appear from the copious extracts made from his work, that these, as well as his conclusions, are inconsistent with his facts; of course, they must fall to the ground. It will be proper, however, to point out a few instances of misrepresentation, which occur p. 172, 173.

"And first (says Dr. C.) let me place the venerable Sydenham, in general sagacious in his inquiries, and ever actuated by the spirit of fidelity in relating their results: Engaged in extensive practice, this medicine was frequently exhibited by him, and in so great a variety of instances, his attentive mind *could scarcely fail being struck with the stimulant powers it so obviously possesses*; and we accordingly find, that he not only frequently prescribed it with an intention of supporting the powers of nature when languishing or oppressed, but considered it as the most supreme cordial ever discovered: "Et præstantissimum sit remedium,

* Novum organum, lib. 2. aph. 46. circa finem. It would have been prudent in Dr. C. to have refrained from this display of his motto, as it does not appear from his work that he paid much regard to the instruction it contains.

† Ib. Aph. 41.

remedium, *cardiacum unicum* pene dixerim,"* are the expressive words he employs in conveying this sentiment to his readers. † That the celebrated Cullen perceived similar effects, and prescribed it with similar intentions, will be evident from a slight perusal of his practical works. ‡ In Haller's Commentaries on the Institutes of Boerhaave, we meet with a passage which clearly proves that he also was struck with its stimulant properties, as he therein compares its action to one of the most powerful stimuli we are acquainted with." "Opium," says he, "*Non alia ratione agit in corpus, quam alcohol.*" § "A sentiment also adopted by Huxham, who, speaking of the employment of opiates in small-pox, says, "They are similar in effect to large doses of spirituous liquors." ||

Upon the whole, I trust it has been demonstrated, that the proofs adduced by Dr. Crump in support of the stimulant theory, are both deficient and fallacious; that the explanation it affords of MANY, I believe I may truly say of ALL the phenomena in question, is unsatisfactory; that facts and experiments inexplicable and inconsistent therewith do occur IN GREAT ABUNDANCE: and having fully substantiated these charges, the theory in question stands convicted upon the fullest and fairest evidence, OF BEING ERRONEOUS; it will, therefore, only remain to pronounce the sentence which Dr. Crump has passed upon every erroneous theory, namely, THAT IT BE CONSIGNED BY ALL TO MERITED OBLIVION. ¶ And the sooner the sentence is carried into effect, the better will it be for mankind at large; because, independently of avoiding the numerous evils which must ever be the consequence

* Sydenhami Opera, Sect. 4. Cap. 3.

† Dr. Crump here evidently puts a forced construction upon the words of Sydenham, who does not in this passage at all allude to its possessing stimulant powers; he merely speaks of its cordial properties; and it would be a reflection upon his sagacity to suppose he would have prescribed a stimulant medicine with an intention of supporting the powers of nature when languishing or oppressed. It is more probable, I conceive, that he would prescribe medicines of a contrary nature, whose effect would be to diminish morbid sensibility and irritability, and take off irregular and painful action. Such a medicine would be the most supreme cordial, and such is opium. But Dr. Crump uses the words cordial and stimulant indiscriminately.

‡ Here no particular instances are pointed out, and the opinion is not agreeable to the general tenor of his writings.

§ This passage by no means proves that Haller was struck with its stimulant properties. All it implies is, that opium acts upon the body in the same manner as alcohol. According to this mode of interpretation, an author may be made to say whatever his Commentator pleases.

|| Dr. Crump here takes the same liberty with Huxham, which is, at least, the third instance of misrepresentation that occurs in the space of a single page.

¶ "In examining any particular theory, (says Dr. Crump) our attention will be naturally turned to the proofs adduced in its support; the explanation

consequence of putting erroneous principles into practice, such a measure, if followed by the general adoption of the sedative theory, would lead the way, unless I am greatly deceived, to considerable improvements in the Practice of Surgery as well as medicine.*

Manchester, Sept. 6, 1802.

[To be continued.]

tion it affords of any phenomena in question, and its coincidence with, or repugnance to, particular facts and experiments. *If the first be deficient or fallacious, the next unsatisfactory, and facts and experiments inexplicable or inconsistent occur, the opinions in question are surely to be deemed erroneous, AND CONSIGNED BY ALL TO MERITED OBLIVION.*" Inq. p. 144.

* Where any doubt remains, no information ought to be withheld which can tend to elucidate: It is only on this ground, I think it proper to communicate the following intelligence, which comes from very good authority.

"Extract of a Letter from ——— to ———.

"I have been informed by ———, Esq. F. R. S. who went to the East Indies in the Medical line, that the collectors of opium employ thirty men for several months together, during ten hours every day, with their hands and part of their arms constantly immersed in the poppy juice, without experiencing any soporific, much less any poisonous effects from its absorption. Does not such a fact strongly argue against the external application of opium as a remedy? Mr. ——— is a very intelligent and respectable witness."

To which I answer, that it would be establishing a bad precedent to allow a single well authenticated fact on one side of a question, to *invalidate a great number of equally well authenticated facts* on the other side. But there is no necessity for resorting to this plea on the present occasion, for the following reasons.

If the juice is absorbed, we cannot be surprized that it should not produce the effects mentioned, *after a few days have elapsed*; (we are not told whether the men are affected by the juice *on their first entering upon the employment*, nor whether they have been previously in the habit of taking opium internally: and yet it is of importance these particulars should be known,) if we recollect that where a person has been accustomed to take opium, either medicinally, or for other purposes, it becomes necessary to go on *increasing the dose progressively*, in order to produce a given effect; (for the same reason, taking tobacco *in any form*, soon ceases to produce effects equally powerful as at first.) Besides, *the exercise requisite for preparing the juice, must operate powerfully in counteracting its effects.*

If the juice is not absorbed, it proves, either that it renders the lymphatics torpid by its immediately sedative effects upon their coats, or, that friction is necessary to enable them to absorb a sufficient quantity to affect the system at large.

Some Observations respecting the Cause, Nature, and Cure of Gout; communicated by Mr. BLEGBOROUGH, Surgeon, of Oxford Street.

THE numerous authors, who, since the time of Hippocrates, have written on Gout, have differed so materially respecting its cause, nature, and cure, that the scepticism of the most eminent physicians of the present day, with respect to every thing that concerns the treatment of it, has almost ceased to surprize. Some have carried their doubts so far as to believe that nothing ought to be done in the disease, but that it is better to leave it altogether to time, patience, and flannel. In Germany it is not unusual for one, who is known to have been attacked with the piles, to have the earnest congratulations of all his neighbours, as a circumstance in which his welfare is much concerned. In England this is in some measure the case with respect to the Gout. They are equally ridiculous. That these diseases keep off others, I cannot believe; that they dispose to many, and those of the worst kind, I have little doubt. This unwarrantable indifference in regular practitioners, to a disease for which, nevertheless, much may be done, has, as might be expected, opened a door to the pretensions of the Empyric, whose random attempts will not cease to scourge, till the former shall have it in their power to propose some more successful mode of treatment. The causes and cure of Gout are so intimately connected, that when the latter is attempted, the former ought never for a moment to be lost sight of. These causes are the improper and premature applications of those powers which, when duly applied, sustain life; as, heat, the ingesta, the blood, the powers of the mind, as sensation, passion, and thought.

From the moment that life commences, every period of it demands the application of its appropriate degree of those exciting powers; and the system is in a low, high, or exhausted state of excitement, in proportion as they are applied in defect, excess, or in a too uniformly excessive degree.

Gout is generally the consequence of the latter, or, in other words, arises from an unduly exhausted excitability, which induces debility and relaxation of the solids, destroying their tone, and rendering them unfit to resist the action of the vascular system. Thus are the fluids pushed beyond their proper channels, not to be returned but by an effort at the expence of the strength of the whole system. Among the causes, the ingesta act most powerfully, for they induce most of the rest, even the most inordinate affections of the mind. The use of alcohol, in whatever shape, is beyond doubt so active an agent in producing
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the disease, that I am of opinion it never yet occurred to any person, however strong his hereditary predisposition, and in whatever excess all the other causes might have been applied, unless this one had also been superadded. Alcohol most effectually debilitates the functions of the stomach, on which the due performance of all the other functions of the body depends. It particularly disturbs those of the liver, a torpid state of which is frequently the immediate cause of severe paroxysms of the disease. The punishment of Prometheus then scarcely exceeded his crime! High seasoned food and all the other causes act their parts, but subordinate to that already mentioned. The depressing passions of the mind, as fear, grief, &c. powerfully contribute to the formation of this disease, whose foundation is often laid in early life, and before we are in the least aware of it. The state of collapse *post coitum* also peculiarly predisposes to it, and its severest paroxysms often immediately succeed immoderate exertions of this nature. The Gout, except under some peculiar circumstances, where the hereditary predisposition is very strong, and conjoined with many of the exciting causes, seldom attacks before the age of thirty-five. At this period, if the resisting and contractile power of the animal fibre be weakened, and the tone of it lost by debauchery and idleness, the disease will make its appearance even without the hereditary predisposition.

Though I intend not to deny that our constitutions like our persons, are frequently very similar to those of our parents; yet I mean to contend, that any one, by attention to regimen, &c. may entirely alter that specific state of the solids, which constitutes the gouty diathesis, however strong his hereditary predisposition to it may have been. That the Gout then is neither hereditary nor incurable are facts which it greatly imports the descendants of gouty persons to know. The contrary idea, as erroneous as mischievous, has, without doubt, much increased its martyrs, as nothing is more common than to hear a person declare, that as his father had the Gout, it is impossible for himself to escape it; so, why should he deprive himself of the many gratifications which are within his reach. The consequence of such reasoning needs no elucidation, as every day affords but too many melancholy proofs of it. The present Duke of Portland, and Dr. Gregory of Edinburgh, who in early life were both attacked by the disease, and whose fathers both suffered severely from it, are living testimonies that it is neither hereditary nor incurable, but that an entire and systematic change, from that mode of living which induces it, will be sufficient to ensure the Patient from its subsequent attacks, and that this change is not, as has been erroneously imagined, incompatible with the enjoyment of good health.

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Though this disease, in general, occurs without evident external causes, yet they are not always wanting, as bruises, exposure to cold, &c. Pyrexia, though sometimes wanting in slight cases, seems always to accompany violent paroxysms of it. Stomach complaints I believe always precede it, and ought to be considered as its never-failing harbingers. We cannot then pay too great attention to the state of the stomach, as on the due performance of its functions so much depends. Whatever overloads or heats this organ, gives rise to an excitement of the whole system, greater than natural, and ultimately induces that species of debility without which the disease cannot exist. In proportion as the strength of digestion diminishes, parts more essential to life become affected: The powers of the system not being adequate to the establishment of regular paroxysms on the extremities as formerly, the lungs—head—heart, &c. begin to suffer in turn, and we have difficulty of breathing, asthma—giddiness, intellectual confusion—palpitations, faintings—and very often sudden death. The atonic, retrocedent, and misplaced Gout, are distinctions on which too much stress has been placed; they ought to be considered only as advanced stages of the disease, and prove to us that prevention would be better than cure. However, as every treatise on the disease describes its history and regular progress from stage to stage, I shall content myself with what is already said on this part of the subject, and shall attempt a few ideas respecting the method of cure.

THE CURE OF GOUT is not to be expected from a pill or a potion; charms and amulets will avail nothing; neither is it the work of one, or perhaps, in some cases, of several years, entirely to eradicate a disease which has been so many in establishing itself. Nevertheless, much misery may in the mean time be anticipated by comfort. Should, however, this great object be attainable on any terms, or in any period of time, he who would not willingly submit to the means must know little of the sufferings it inflicts, and be totally unacquainted with the nature of a disease which grows with our years, and curtails or renders miserable the latter half of the life of those who are subject to it. This object then is to be obtained by moderating the paroxysms while present, and by removing their recurrence to a greater distance by attention during their intervals. The first of these intentions is chiefly to be effected by topical applications. That no irritation ought to be added to the system during the paroxysms of Gout is entirely agreed on among Physicians: But it is also agreed, that any remedies which, without producing irritation, may tend to moderate the violence of inflammation, are admissible; as violent in-

flammation

inflammation weakens the tone of the parts, and invites a more frequent return of the paroxysms, which become more violent, and affect parts of greater consequence as the disease advances. Electricity has been found serviceable, in some cases, during the wane of the paroxysms, by taking sparks from the parts affected, the only way in which its application is admissible. Great care and caution are, however, necessary, not to excite the part beyond that degree which its state of collapse at the time specifically demands. The application of cold also, at this period, under proper management, may be made to produce beneficial effects, by restoring tone to the parts and vigour to the system. But the inflammatory spasm of the parts affected, during its greatest violence, is best subdued by a proper application of warmth, and that perhaps in the form of vapour, regularly and uniformly, for some time, applied at a proper temperature. For this purpose, the Air-pump Vapour Bath of Mr. Smith, mentioned in your Journals of April and July last, is, beyond doubt, the means best adapted for the application of it. Vapour, while it produces all the good effects of warm bathing, does not at the same time debilitate and relax. According to my observations on its application in the above manner, it seems uniformly to produce tonic effects, which removing the pressure of the atmosphere at the same time, (by making the parts take on a new action, and by powerfully promoting *that* of the absorbents) seems very much to aid. The capacity of the vascular system, and the propelling power of the *vis a tergo*, are at the same time increased. The violence of the pain, and of course the systematic fever, are abated, and the excitability suffered to accumulate.

Large portions of the lithiat* of lime are also, during this application, frequently removed, and would, in every instance, I am persuaded, be prevented from forming by a timeous application of it. This substance, which ought to be deposited in the bones, but from the weakness of the vessels destined to perform this office, is not suffered to reach its destination, collects in such quantities as to bolster up the joints of the toes and ankles so as to render them completely ankylosed. This matter, by an uniform action kept up on the parts for some time, and frequently repeated by well-regulated applications of the machine, is in a great measure removed, and limbs rendered

* Vid. Examen des Experiences & des Observations nouvelles de M. Pearson sur les Concretions Urinaires, &c. d' l'homme par Mons. Fourcroy. Annales de Chimie, vol. xxvii.

dered useful, which would not be the case by any other means with which we are acquainted.

The paroxysms are placed at a greater distance, and thus the second intention is also powerfully aided by this application. The action of the disease is suspended, while all the other remedies may be employed in turn. The principal one with this intention is a radical and systematic change of that mode of living which originally induced it. The miserable patient must retrace his steps; but this must be done gradually, and with great caution. The exciting causes must be referred to, and their undue action as gradually diminished as it was induced. The advice of old Dr. Pitcairn to the Highland Chieftain, who had been in the habit of drinking a large goblet of whiskey every day, and who was desirous of leaving it off, ought to be attended to, which was as follows: "That he should melt as much wax every day into the goblet as would admit of the impression of his seal;" by which means the quantity of the whiskey was diminished daily, and the habit got rid of in the best possible manner.

The ingenious but unfortunate Dr. Brown pursued a different plan. Supposing the enemy might be taken by a coup-de-main, he boldly pushed as a remedy the concentrated force of the causes of the disease. On this rock he split, and expiated his fate! a melancholy proof, that when great genius falls into errors, those errors are frequently not of a trivial nature. A proof also, that he who certainly surpassed mankind in genius, either mistook his own doctrine, or, what is infinitely less to the credit of humanity, was not able to resist those habits, which never fail of producing the same catastrophe. Higher stimulants than usual may for a time give relief, but eventually produce greater debility; and the example of Dr. Brown ought to operate as a negative one for ever.

The deceitful, injurious, and mischievous effects of the Portland powder, I should have considered as unnecessary to have mentioned here, had not the ingenious and venerable Dr. Heberden declared his dissent from those who ascribe to its dangerous effects.*

Werlhoff†, a German, and First Physician to his late Ma-

* Pulvis Portlandicus præ se fert æque adversus utrumque prodesse; neque negaverim hujusmodi medicamenta, simul cum opio adhibito sic ut opus fuerit, fieri posse præsentissima antarthritica pariter et antirheumatica remedia.

† Sed ex nimio horum amaricantium usu, fermentum stomachi adeo debilitatum esse memini, ut nonnulli appetitum amiserint, cibos non concoxerint, mortem hinc potius quam sanitatem accelerarint; malique et insulti remedia sævas dederint pœnas. — Werlhoff Cant. Med. p. 346.

jesty, for Hanover, condemns bitter remedies in the Gout, and is supported in the opinion by Murray*, the Gottingen Professor. Doctors Cullen, Darwin, and Falconer of Bath, strenuously support the sentiments of the latter, and adduce the most unequivocal proofs of their baneful effects. "In every instance," (says Dr. Cullen in his *Practice of Physic*, sec. 557) "which I have known of its exhibition for the length of time prescribed, the persons who had taken it were, indeed, free from any inflammatory affection of the joints, but they were afterwards affected with many symptoms of the Atonic Gout, and all, soon after finishing their course of medicine, have been attacked with Apoplexy, Asthma, or Dropsy, which proved fatal." In a later publication, he observes, "It is possible that several persons may have taken the Portland Powder and other bitters with seeming great advantage, but I have not had opportunity to know the sequel of the whole of such persons lives, so as to say positively how far, in any case, the cure continued steady for a life of some years after, or what accidents happened to their health. But I have had occasion to know, or to be exactly informed, of the fate of nine or ten persons who had taken this medicine for the time prescribed, which is two years. These persons had been liable for some years before to have a fit of regular or very painful inflammatory Gout, and particularly when they had completed the course prescribed, had never a regular fit, or any inflammation of the extremities for the rest of their lives. In no instance, however, that I have known, was the health of these persons tolerably entire. Soon after finishing the course of their medicine they became valetudinary in different shapes, and particularly were much afflicted with dyspeptic, and what are called nervous complaints, with lowness of spirits. In every one of them, before a year had passed, after finishing the course of the powders, some hydropic symptoms appeared, which gradually increasing in the form of an ascites, or hydrothorax, especially the latter, joined with anasarca, in less than two, or at most, three years, proved fatal. These accidents happening to persons of some rank, became very generally known in this country, and has prevented all such Experiments since. †

* Ex pulvere Arthritico multi Apoplexiam, paralyfin vel morbos acutos, senes precipue, contraxerunt. Et in homine, quodam arthritis quidem inde sedata, sed respiratio difficilis, tussis sicca, morsque subitanea, successit, tuberculis pulmonum post mortem conspicuis.

† Cullen's *Mat. Med.* vol. ii. p. 65, 66.

Murray, vol. i. p. 355.

Were it necessary to adduce further proof, Soranus among the antients might be mentioned, as bearing testimony that these remedies were then held in no better estimation than at present.

• A steady adherence to an abstemious and regular course of diet, consisting of milk, vegetables with an admixture of animal food, of the mildest kind, seems to be the only plan to be depended on for a radical cure of the gout.

The advice Dr. Darwin gave to one of his patients, applies best perhaps to the majority of cases, which was as follows:

“ Drink no malt liquor on any account. Let your beverage at dinner consist of two glasses of wine diluted with three half pints of water. On no account drink any more wine or spirituous liquors in the course of the day; but if you want more liquid, take cream and water, or milk and water, or lemonade, with tea, coffee, chocolate. Use the warm bath twice a week for half an hour before going to bed, at the degree of heat most grateful to your sensations. Eat meat constantly at dinner, and with it any kind of tender vegetables you please. Keep the body open by two evacuations daily, if possible, without medicine; if not, take the size of a nutmeg of lenitive electuary occasionally, or five grains of rhubarb every night. Use no violent exercise which may subject yourself to sudden changes from heat to cold; but as much moderate exercise as may be without being fatigued or starved with cold. Take some supper every night, a small quantity of animal food is preferred; but if your palate refuses this, take vegetable food, as fruit pie, or milk; something should be eaten, as it might be injurious to fast too long.*

Dr. Cadogan has laid down some simple and judicious rules respecting regimen and management in a Treatise on this disease, which might be consulted with advantage by those labouring under it. Spirituous and fermented liquors, and fatigue of body and mind, ought equally to be avoided. Long fasting, night watching, and above all, the depressing passions, are extremely prejudicial. It is more from attention to those circumstances, and to judicious management with regard to them, than to any medicine either regularly prescribed or empirically recommended, that a cure is to be looked for; and notwithstanding the boasted powers of medicine and nostrums, I am of opinion that little is to be done for the cure of this disease through the medium of the stomach, except by an uniform and gradual diminution of stimuli; and finally, a total abstinence from spirituous

* Darwin's *Zoonomia*. Class, iv. 1, 2. Vol. ii, p. 457.

and fermented liquors. Nevertheless, should the stomach or head be attacked, or threatened with an attack, during the progress of cure, cordials and stimulants are then not only admissible, but ought to be administered with some degree of freedom. Madeira wine, with this double intention, is doubtless among the best. To obviate costiveness, under these circumstances, nothing less warm than the tinctures of rhubarb or senna ought to be administered. That degree of excitement which the languid state of the system requires ought to be duly supplied by every possible means. The application of heat is certainly among the most powerful of these; and the best mode of making it, *that* already alluded to, while the removal of the atmospheric pressure from the extremities seems to have considerable effect in determining the affection to them. The causes and cure of this disease, to a certain extent, are the same, and differ only in the proportions and manner in which they are applied. This seeming paradox is well expressed by a Roman poet:

“Balnea, Vina, Venus consumunt corpora nostra,
Sed Vitam faciunt Balnea, Vina, Venus.”

Thus it seems, that while debauchery and inactivity are the sources from whence the disease springs, temperance and activity never fail to prevent, and seldom to cure it, even after repeated attacks. Life is no longer desirable than whilst it can be enjoyed with satisfaction and comfort. The first rule towards acquiring this, is to avoid excess in eating, drinking, and in mental exertion; to cultivate whatever promotes good humour, a cheerful disposition, and good spirits. Regularity of hours, early rising, a due proportion of sleep, pure air, wholesome food, warm cloathing, and moderate exercise, are of essential importance: But to expect a radical cure of the Gout, without regard to these; or, while the same plan which gave rise to it, is pursued, would be as ridiculous as though a person who had been cured of a leg broken by jumping down precipices, should expect that his having been cured of it once, should ensure him against the like accident in future, though he should continue to run the same risks.

Sept. 13, 1802.

To the Editors of the Medical and Physical Journal.

GENTLEMEN,

I Felt great pleasure on reading Mr. Blegborough's Observations on the use of cold Water in the treatment of Typhus, in your valuable Journal of August last. My

My mind fully enters into, and goes along with every sentiment there expressed; and I trust I may, without presumption, be allowed an opinion on this occasion, having within the last six months, as he expresses it, passed the fiery ordeal myself. In my case, the treatment recommended by Mr. Blegborough was adhered to exactly, and under his own direction, so that the conviction of its propriety may be rather said to have obtruded itself upon me, than to have been fought for; and I am at a loss to know which to admire most, the simplicity, or the comfort and the advantage of the plan. That the use of cold Water in Typhus should not have become more general amongst medical men, since the writings of Dr. Currie, is something astonishing; and more so, since I have experienced the beneficial effects of it myself. Amongst the reasons, perhaps, a powerful one is, that physicians, and more particularly the eminent, are seldom called at the commencement of the disease, so that they have but few opportunities of noting its progress, which is a material circumstance in the treatment of a disease, the propriety of which appears to consist more in preventing the accumulation of those symptoms that go to the composition of its worst form, than in curing them, after they have been suffered to take place; unless we wish to create giants, with no other intention than that we may have the satisfaction of destroying them, without regard to the hazard of the conflict. It has been confidently advanced by one physician, that Typhus was no longer formidable, since it might, at any time, be safely and expeditiously cured by a table spoonful of yeast. Though this gentleman has called it a specific, he has, nevertheless, never made good his position; and I cannot understand how it can act, except by the antiseptic quality of the fixed air which it contains: The antiseptic and tonic quality of bark are now, I believe, generally allowed to depend upon the tanning principle that enters into its composition.

The necessity of these, however, as well as all the more powerful antiseptics, is entirely superseded by the use of cold bathing: By the timely application of this remedy, the stomach, which should in every stage of the disease be as little as possible interfered with, is spared the trouble of assimilating what, under other circumstances, might be necessary, but what the system always struggles to reject; and thus is a conflict suspended, which by inducing heat, often lays the foundation of all the subsequent mischief.

In a matter of so much importance as the treatment of Typhus Fever, nothing ought to be assumed, but facts ought carefully to be noted as they occur. That the application of cold water is followed by the happiest effects, in the cure of this disease, is a very important one; and I have no doubt, and trust ere

long, to see it universally adopted to the full extent of its utility. After the full, clear, and perspicuous account which Mr. Blegborough has given of the matter, it would be presumptuous in me, to enter more fully into it; neither have I vanity enough to suppose, that I am able to add any thing of consequence to his account. Thus much I have considered it my duty to state; and I shall be very happy indeed, if my testimony may be found to add weight to the propagation of a plan, which I am confident is founded in reason, and will be supported by experience, for there is not the smallest doubt, and I have no hesitation in saying, from my own knowledge of my case, that the more it is put in practice, and followed up, the more it will be admired. I am, &c.

No. 15, Thornhaugh Street, Bedford Square,
September 20, 1802.

JOHN PEARSON.

To the Editors of the Medical and Physical Journal.

GENTLEMEN,

I have met with several cases of Puerperal Jaundice occurring in early pregnancy, that yielded to the most simple method of treatment; in advanced pregnancy we have, however, to fear its fatal effects, owing to the great weakness and relaxation of the system attending this disease, which must be greatly increased by the debility accompanying parturition. The two following cases are instances of the fatal tendency of Puerperal Jaundice; as I thought them singular, I have transcribed them from my journal book. If you think them worthy a place in your useful Journal, their insertion will oblige your's &c.

Aberdeen, August 16, 1802.

T. P.

CASE I.

I was sent for to deliver B. F. about four o'clock in the morning; the room was on the ground floor, seemed very damp, and had a rotten smell, with a small lamp burning which afforded but little light. I had not seen the woman before, and jaundice being a disease which is not so perceivable at night, although assisted by a good light from candles, which was not the case here, I therefore did not discover that she was labouring under this disease, till day light, notwithstanding she had the symptoms of it; but labour pains attending at the same time, my chief attention was paid to the latter. When I examined her

her previous to delivery, she said she had been for some time affected with sickness and vomiting, loathing of food, pain in the epigastric region, and a short cough. At my first arrival her labour-pains were gentle; she was sitting in a chair, and would not be prevailed upon to be delivered in her bed, observing that she was always delivered out of bed with all her other children. In less than two hours from the time I first went there, she was delivered; the labour was natural, the amnion tumour burst of itself, the vertex presented, and the delivery was very easy to the woman. The placenta was also very easily brought forth. After the woman was delivered, I went home; and in the morning when I again visited her, I perceived her face, eyes, and whole body, very yellow; she seemed however pretty easy, and spoke with a strong voice; but did not pay much attention to any person around her. When asked how she felt herself, she said she was tolerably easy, and had no complaint. She continued pretty easy till the evening of the second day after delivery; when she was seized with coldness and shivering, attended with incoherency of speech. Next morning when I visited her, she was perfectly insensible, affected with stupor and coma, appearing as if she were in a constant sleep; her urine, which was of a deep yellow colour, she voided insensibly; belly costive. She never opened her eyelids, and in that condition took whatever drink was given her; she never asked, however, for drink or any thing. Wine and other stimulant cordials were given her, which she swallowed when put into her mouth. Her head was shaved, and a blister applied, which acted well, and contained a yellow lymph. All the medicines that were applied, had no effect, either in bringing her to her senses, or removing the jaundice. A clammy sweat continued on her skin from the time of her becoming insensible; her swallowing became more difficult; and a snorting attended. Her pulse kept always from 70 to 75, till within a short time of her death, which happened five days after her delivery.

CASE II.

I was called to I. H. on a Friday forenoon; she was in bed; her skin was of a deep yellow colour; during my stay there, she vomited a great quantity of brown stuff. The vomiting had been very frequent during the morning. She appeared to be torpid and insensible, with a quick and small pulse, and a short tickling cough which seized her now and then. When I asked what she felt sore or uneasy to her, she answered with a weak voice, that she had a pain at her breast, and that

her whole body was sore. I ordered her a weak cordial mixture, with a view to settle the vomiting. I was not a quarter of an hour gone, when labour pains came on. The midwife was attending, and she was delivered of a child with a few pains. In half an hour after delivery, they sent for me again, saying, she was worse. The vomiting had only seized her once; but the torpor and insensibility were increased. When I asked the midwife concerning her labour, she answered, that the patient appeared to have a desire to void her urine, and when she was assisting her, she found the child's head in the pelvis, which was delivered by a few pains. On Friday afternoon and evening she became still worse, appearing to be asleep and quite insensible. I applied a blister to her neck, and ordered her to get plenty of wine; she, however, still grew worse, and lived only till four o'clock on Saturday morning.

To the Editors of the Medical and Physical Journal.

GENTLEMEN,

ON perusing the last Number of your very useful Journal, my attention was particularly attracted by the description of a Pulmonary Polypus, related by Doctor Eric Acharius; and this case called to my recollection a similar one that had offered itself to my notice some time since, when I was First Assistant Surgeon on board his Majesty's hospital ship Argonaut, at Chatham. The remark that Dr. Warren was the only person who had recorded an instance in all respects correspondent, has induced me to offer the following to your notice, with a request that you will publish it if you deem it worthy a place in your Miscellany.

Mr. William Ashburner, master's mate of his Majesty's ship Lion, about forty years of age, was received into the hospital on the 7th of October, 1800, labouring under typhus fever. The surgeon of the Lion had not sent with the patient any precise statement of his case; but I learnt the following particulars from an officer belonging to that ship, who was received into the Argonaut at the same time with Mr. Ashburner. He had been on the Mediterranean station three years, and during that time had been frequently afflicted with scurvy; His general health was very indifferent; his constitution was impaired by a too liberal indulgence in spirituous liquors, and he had been ill some days previous to his removal from the
Lion,

Lion. I saw him in an hour after he came on board; he was in a low delirium; a blister was immediately applied between his shoulders, and the *Angustura* bark, with aromatic confection, was copiously exhibited. He was ordered to drink a pint of Port wine within the next twenty-four hours. The medicine sat well on the stomach; but the wine uniformly excited a vomiting and bleeding at the nose. This was as distressing as remarkable, for his debility being so great, every drop of blood effused was a loss of a valuable consideration. On changing the red wine for Mountain, and the *Angustura* for Cinchona, with vitrollic acid, these unpleasant effects ceased. He drank a bottle of this wine daily, during the remainder of his illness. The delirium continued, and he became gradually lower until the 13th, when the nurse informed me, that he had coughed up a knot of small worms, and that he had, on the same morning, frequently brought up others, which she had thoughtlessly thrown away. On this day he died. Before this expectorated substance was washed, it had much the appearance of the tape worm; but after cleaning it from a dirty looking mucus, I observed it divided into numerous branches, which again ramified into smaller twigs, forked like the claws of a green crab. From its appearance, and the manner in which it was expectorated, I have no doubt of its being a pulmonary polypus. I have preserved it in spirits, but it begins to change its colour, which at first was very white, and appears to rather dissolve in the spirits. As these polypi are not common, and as it may be of more utility when displayed amongst a collection of rarities than it can be in the narrow circle of my communication, I beg to offer it to you as a present, if you think it may merit your acceptance.

I am, &c.

Brompton, Chatham,
Sept. 10, 1802.

JAMES BRENNAN.

Observations on a Fistula in the Stomach, through which the interior of this Viscus could be seen; by Cit. CORVISSART and LE ROUX.

A Woman happened to fall in a violent manner upon the threshold of a door, when she was in her twentieth year, by which the left side of the thorax and epigastric region were considerably hurt; she recovered however after some time, and performed her usual work, though there remained in that region a painful

a painful sensation, which she endeavoured to alleviate by bending the body towards the left, and by holding the hand on the affected side. In this state she had remained for about eighteen years, when an oblong tumour made its appearance at the painful place. Twenty days after an aperture was occasioned in it, while the patient was vomiting, through which the water issued which she had just swallowed. She felt herself, however, much relieved by it. She closed this fistula with a compress, through which a quantity of gastric humours continually oozed; and eight months after, the food began to pass through the aperture, causing at the same time much pain. The margins of the wound became red, and the aperture gradually increased, and after three years its diameter was .0015 by .0010; it was situated at the anterior extremity of the eighth and ninth rib. Eight years after, this woman, at the age of forty-six, went to Paris in a carriage from a place forty-four leagues distant, without experiencing the least inconvenience; she was received in the Hospice de la Charité. The fistula had then an oval form, and its margins were of a red colour; the interior of the stomach could be distinctly seen to be furrowed with longitudinal folds, and covered with a glossy mucus. Whenever the patient introduced food into the stomach, it could be seen to descend at every deglutition, in form of a cylinder, attended with a certain quantity of air. Almost instantly, however, the food issued out from the opening by a kind of peristaltic motion, which was produced by the transversal plicae closing over one another.

Every day, about three or four hours after a meal, the patient let the food pass out from the aperture, to which she was stimulated by a particular disagreeable sensation. Several attempts had been made to apply different stopples, but she could bear none, except a double compress; she used to wash the stomach every evening with a pint and a half of water, after which she went to bed and slept pretty well. She went to stool only once every ten days, and the excrements were hard, yellowish, and in small quantity. Such was the state of the patient, when experiments were first made with the matter that issued from the stomach. On examining chemically a frothy liquor, which was found every morning to be accumulated in the stomach, and which may be considered as the succus gastricus, it was found to have the most striking analogy with saliva. The food which she had kept in the stomach for above three hours was also examined, and compared with that not yet consumed; its weight had been considerably augmented by the addition of a certain quantity of gelatina, and of a substance
which

which had the greatest analogy to the *materia fibrosa* of the blood. The proportion of muriat of soda and phosphat of soda and of lime had been likewise increased. These experiments were intended to be continued, when an acute disease carried her off within three days. On opening the body, the abdominal viscera were found in a sound state; the stomach adhered to the sides of the abdomen, and the fistula was situated on its anterior part, seven fingers breadth from the cardia and four from the pylorus.

ACCOUNT OF DISEASES IN AN EASTERN DISTRICT OF LONDON,

From August 20, to September 20, 1802.

ACUTE DISEASES.			
Typhus	- - - - -	Hæmorrhoids	- - - - - 3
Dysenteria	- - - - - 7	Amenorrhœa	- - - - - 10
Cholera	- - - - - 46	Fluor Albus	- - - - - 7
Rheumatismus Acutus	- - - 3	Menorrhagia	- - - - - 5
		Dysuria	- - - - - 4
CHRONIC DISEASES.		Rheumatismus Chronicus	- - - 7
Tussis	- - - - - 5	PUERPERAL DISEASES.	
Dyspnœa	- - - - - 4	Menorrhagia Lochialis	- - - 5
Tussis cum Dyspnœa	- - - 8	Dolores post Partum	- - - 7
Hæmoptysis	- - - - - 3	Mastodynia	- - - - - 4
Hydrothorax	- - - - - 4	Ragas Papillæ	- - - - - 3
Acites	- - - - - 3	INFANTILE DISEASES.	
Anasarca	- - - - - 4	Erysipelas Infantilis	- - - 3
Cephalalgia	- - - - - 5	Pertussis	- - - - - 2
Paralysis	- - - - - 2	Ophthalmia	- - - - - 6
Diarrhœa	- - - - - 20	Ophthalmia Purulenta	- - - 4
Enterodynia	- - - - - 5		

In the list of diseases prevailing for some weeks, those which have their seat in some part of the alimentary canal have formed the largest proportion. That which makes a principal figure in the list for the present month is the Cholera Morbus. Of patients labouring under this, the number has been uncommonly large. This disease, indeed, may be considered as the epidemic of the Autumnal Months. It is characterized by a very copious discharge from the stomach and bowels; Purging and vomiting are the most prominent symptoms. These, in some cases, go on at the same time; but, in others, they occur alternately. The fluid discharged is of a bilious nature. Dr. Saunders observes, "that it is bile in a very diseased state:" And he thinks it probable, "that from the quantity secreted, and the rapid manner in which it is poured into the duodenum, there is not time sufficient for a perfect secretion, that the fluid there-

fore

fore is somewhat of an intermediate nature between blood and bile."

The disease is often preceded by uneasiness in the stomach and bowels; a sense of fulness about the præcordia, heartburn, and flatulence sometimes give warning of its approach; and in the course of the disease there is often not only pain, but considerable distention of the abdomen. Spasmodic affections of the lower extremities also form a symptom of the complaint. Retention of urine is, in some instances, a source of additional distress to the patient; and if these symptoms are accompanied by **general convulsions**, a fatal termination must be expected. Though this disease seems to depend for its *principal* occasional cause on the heat which prevails at this season of the year, or on the sudden change of temperature; yet it may often be produced more hastily by filling the stomach with large quantities of indigestible food.

In the number of cases referred to in the list not any one proved fatal. The cure was in general conducted by dilution of the contents of the stomach and bowels, by some emollient and demulcent liquids; and by interposing an anodyne, as it was found necessary for the abatement of pain, or for the removal of spasm in the intestines, or any other parts of the body.

List of Diseases at the Bath City Dispensary, from August 1, to September 1, 1802.

Angina - - - - -	2	Pulmonary Complaints - - -	8
Arthritis - - - - -	1	Phthical - - - - -	6
Anasarca - - - - -	4	Phthisis Scrophulosa - - -	1
Asthenia - - - - -	1	Peripneumonia Notha - - -	1
Bilious Complaints - - -	4	Paralysis - - - - -	3
Colica - - - - -	2	Psora - - - - -	1
Dysentery - - - - -	2	Rheumatismus Acutus - - -	11
Diarrhœa - - - - -	1	Rubeola - - - - -	2
Erysipelas - - - - -	2	Synochus Biliosa - - - - -	17
Enteritis - - - - -	1	Quotidiana - - - - -	1
Eruptiones - - - - -	2	Syphilis - - - - -	2
Febris - - - - -	4	Scrofula - - - - -	1
Intermittens Quotidiana -	2	Strain - - - - -	3
Gastrodynia - - - - -	3	Typhus Mitior - - - - -	4
Hæmoptysis - - - - -	3	Tussis - - - - -	1
Hæmatemesis - - - - -	1	Tinea Capitis - - - - -	3
Hepatitis Chronica - - -	1	Variola - - - - -	4
Leucorrhœa - - - - -	2	Vertigo - - - - -	1
Lepra - - - - -	2	Vermes - - - - -	2
Lithiasis - - - - -	1	Ulcerated Legs - - - - -	5
Menorrhagia - - - - -	1	Ulcers - - - - -	3
Nephritic Complaints - - -	2		
Ophthalmia - - - - -	1		
		Total	125

CRITICAL ANALYSIS

OF THE

RECENT PUBLICATIONS

ON THE DIFFERENT BRANCHES OF

PHYSIC, SURGERY, & MEDICAL PHILOSOPHY.

Lectures on Comparative Anatomy, translated from the French of G. CUVIER, Member of the National Institute, Professor in the College of France, and in the Central School of the Pantheon, &c. by WILLIAM ROSS, under the inspection of JAMES MACCARTNEY, Lecturer on Comparative Anatomy in St. Bartholomew's Hospital. 2 vol. 8vo. 1802. London.

THE first and most obvious use of the science of Anatomy is to give man such a knowledge of his own structure, as to lay a foundation for the sciences of curing internal disease and relieving the effects of external accident. Hence the anatomy of the human body has engaged in a peculiar manner the attention of enquirers; and this subject has been so thoroughly investigated in those parts that appear accessible to mere industry of research, that a new field must be opened to the ardour of discovery. This *has* been done by the admirable labours of Haller, Monro, Hunter, Blumenbach, and many other illustrious contributors to this interesting science; and Comparative Anatomy, (which indeed has at no time been entirely neglected) is every day rising into importance from the boundless field which it opens to investigation.

Considered as the ground-work of Physiology and Natural History, Anatomy may truly be regarded as a sublime science, and peculiarly so, that branch of anatomy which compares the organs and structure of the human animal with those of the animated world that surrounds him.

An extensive pursuit of comparative anatomy is however within the compass of but a few; it requires more considerable opportunities for collecting subjects than most persons can command; it must be elucidated by numerous specimens and vast museums, and it must summon contributions from the most distant parts of the globe. Such however have been the means of information enjoyed by the author of the valuable work before us; the immense Museum of Natural History at Paris, which supplied such copious materials to the labours of the illustrious Buffon and his worthy coadjutor Daubenton, has liberally opened its treasures to one whose name stands among the very highest of the anatomists of Europe, and whose justly acquired celebrity has attracted a most numerous and well

well-informed class of pupils that will not fail to support the reputation of the School of Paris.

The work of which the present is a faithful translation, was drawn up by Cit. Dumeril from the oral demonstrations of the author, Prof. Cuvier, who honors the editor with the appellation of one of his dearest pupils and best friends, and has given his full and entire sanction to all that it contains, in the following terms: "Having attended my course during four years he has collected all my observations with so much accuracy that it would have been difficult for me to have performed the task better. I have revised his manuscript with the greatest care. I have every where supplied details which could not be conveniently introduced in public lectures. I have rectified such statements as I had advanced too rashly. I have added every information connected with these lectures that I have obtained since their delivery, by my dissections and reading. I therefore do not hesitate to acknowledge this work as my own, and to avow all the assertions it contains." We cannot refuse therefore to consider the present publication as an accurate abstract of the lectures delivered by the learned author, containing the outline of his plan of instruction, and the heads of all the valuable information which is delivered by him from the chair.

Prof. Cuvier has prefixed to the work an interesting letter to J. C. Mertaud, Professor of the Anatomy of Animals in the Museum of Natural History at Paris, in which he owns his high obligation to this Museum and its conductors, and introduces several remarks on the study of Comparative Anatomy, and the design of the present work. He mentions it as a circumstance peculiarly fortunate to him that the invaluable opportunities afforded him by his situation prevented the necessity of constantly recurring to written authorities; and certainly, as the present work is not a history of the Science, but a summary of facts, and a view of its actual state of improvement, the author's excuse for not distinguishing in every place the claims of each discoverer, will readily be admitted. The character of the several writers on these subjects, in Germany, and in our own country, is sketched in the following free and (may we not say) candid terms. "The greater number of these authors are found among a people, who, though celebrated for their inventive genius and indefatigable patience in every kind of research, have not always been able to confine within due bounds their desire to display erudition, a desire which perhaps proceeds from too much modesty, and a mistaken deference for others.

"Another people, no less admirable for their bold views and vigorous prosecution of the sciences, seem to have fallen into the opposite excess of that which I have just blamed, by contemning the labours of foreigners, and esteeming, and even consulting, almost exclusively, the works of their own countrymen. This kind of pride, which is perhaps useful in politics, when carried into the sciences, and, above all, in the sciences which depend on facts, tends only to produce contracted ideas, and leads to a barrenness which forms the character of some of these authors in Natural History.

tory and Comparative Anatomy. I believe I have made use of the principal discoveries of the modern authors who have treated Anatomy in a physiological manner. Stenon, Swammerdam, Collins, Duverney, Petit, Lyonnet, Haller, Monro, Hunter, Geoffroy, Vicq d'Azyr, Camper, Blumenbach, Scarpa, Comparetti, Kielmeyer, Poli, Harwood, Barthez, have furnished the data with which I commenced my career; and though I have myself reviewed a considerable part of these data, the glory of discovering them is not the less due to the celebrated men I have mentioned."

We shall now proceed to give a summary view of the different chapters of this work, in which, though the real value of each division may be nearly the same, there are many that contain only a simple anatomical description of parts, which the student with his subjects before him will peruse with minute attention, and the general reader will be much inclined to turn aside.

The first chapter (or *Lecture*, as the author terms it, though much too copious for a single lecture to a class) contains a very clear and excellent summary of the general laws of the Animal Economy, divided into the heads of, the Organic Functions; the Structure of the Organs; the Differences of the Organs; the Relations of the Organs; and the Division of Animals founded on the whole of their Organization.

The chapter opens with a view of the simple phenomena of life deduced from the decomposition of organized matter by the laws of common chemical action after the vital principle has ceased; but the author acknowledges the insuperable difficulties that attend a research of this intricate nature, as, however near to the origin of life we carry our inquiries, the subject has already enjoyed vital force, and possesses the germ of the phenomena which life may afterwards develope.

We are soon therefore compelled to abandon this hopeless path of research, and must limit our inquiries into the texture and composition of living bodies, and the actual phenomena which distinguish animate from inanimate substances; phenomena which the author characterizes by these three circumstances: "origin by *generation*; growth by *nutrition*; and termination by *death*;" a concise and accurate definition!

This, however, applies to every thing that has life; but there are other less general faculties which indicate organization, but are not the necessary consequences of it, and of these the faculty of *sensation*, and that of *voluntary motion*, are the most remarkable. We are conscious that these faculties exist in ourselves, and we attribute them by analogy, and from their apparent existence, to a number of other beings, whom, with ourselves, we include under the general term — *animals*.

The author then proceeds to shew in what manner these two faculties of sensation and voluntary motion are connected with each other, and how they allow of a greater complication of organs than the vegetable kingdom, and this leads directly to the consideration of the *functions* of living bodies.

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The second head or article of this Lecture, contains an interesting general idea of the structure of the animal organs, and the processes which they are intended to carry on. These are described as they take place in the most perfect animals, but in proportion as the scale of beings sinks, they successively disappear; and in the lowest classes of animals we find nothing but what is necessarily connected with the idea of an animal, namely, a sac, sensible, moveable, and capable of digesting.

The third and fourth articles contain a review of the differences that subsist between the corresponding organs of different animals, and their relations with the other organs of the same animal; and it is here that the more immediate object of the present work, *Comparative Anatomy*, commences.

The fifth article completes the subject of the first Lecture, or general head, by giving a summary view of the actual division which the author adopts in the classification of animals. As these three articles will give the reader an idea of the plan and manner of the work, we shall give a short abstract of their contents.

Two important distinctions subsist in the organs of motion, forming a division of all animals; in the first, the bones form an internal skeleton, articulated and covered by the muscles, and in these the body is supported by a strong pillar formed of several bony pieces placed one above the other, and called the spine of the back. Animals possessing this kind of structure are termed *Vertebral Animals*, a class which includes all the *Mammalia*, *Birds*, *Reptiles*, and *Fishes*. In the second class there are no internal bones, but either merely scales or shells which cover the skin, within which are the muscles, or else there is no hard part that can serve as a lever or point of support for the motions of the animal's body. These are the *Invertebral Animals*, including the *Soft Worms*, *Insects*, and *Testacea*, and they are either entirely soft, or have their bodies and members enveloped in scales articulated on one another, or are enclosed in shells.

The organs of sensation present considerable variety. Some animals have no apparent nervous system, such as the *Zoophytes* and *Polyps*; others, such as the *Mollusca*, the *Crustacea*, *Insects*, and a part of the *Articulated Worms*, have only the brain above the alimentary canal, and have all the remainder of the common bundle of nerves situated underneath, and contained in the same cavity with the other viscera; and lastly, in the *Vertebral Animals*, the common fasciculus of the nerves is situated entirely in the back, above the alimentary tube, and enclosed in a canal which passes through the vertebral column.

All the vertebral animals possess the same senses as man, and taste, touch, and perhaps smell, appear never to be wanting; but the zoophytes and some other classes, want the sense of sight, and no organs of hearing have been discovered in some mollusca and in insects.

The organs of digestion exhibit likewise very important differences; one of the most striking of which is, that in the greater
number

number of the zoophytes the intestines form a sac with only one aperture, which serves both for the admission of aliment and the expulsion of the fæces; whereas, in all other animals, the alimentary sac has distinct orifices for these different offices. The chyle is determined to the body in two different ways; in the zoophytes, and (as the Author thinks) in common insects, the chyle simply transudes through the parietes of the intestinal canal, and bathes all the interior of the body; but in other animals it is taken up and conveyed by its peculiar absorbent vessels. In these latter too, the colour of the contents of the several vessels differs, for the vertebral animals have the blood red, and the lymph colourless; but the mollusca have all the fluids nearly as transparent and colourless as lymph.

The very important differences in the circulation of different animals is next noticed, and the distinction between the *single* and *double* circulation; and in connection with this subject the corresponding differences in the organs of respiration are considered, and the apparent total want of them in the zoophytes.

Finally, the varieties in the mode of generation are described; the generation with or without copulation, and the natural hermaphrodite animals; and several circumstances relating to growth and secretion.

The interesting observations on the relation of the different organs and functions to each other, and their fitness for the circumstances and habitudes of the respective animals, are next pointed out, but in so concise and consequent a manner that they are incapable of abridgment.

The division, or method of arrangement, follows next, a subject of considerable importance; for though in some of the singular forms and varieties of animal organization which Nature displays, she seems to sport with the rules of the mere pains-taking classifier, the man of genius and enlightened observation will often be able to seize on some of the grand and leading features of the admirable mechanism of the animated creation, and open the door to the most interesting and the sublimest speculations.

The arrangement which the Author follows is founded principally upon the leading anatomical features that distinguish the several parts of the animal world. It appears to be clear, elegant, and as free from perplexing anomalies as the nature of the subject will admit of. We cannot enter into the minutiae of this classification, but shall only observe, that the first grand division is that of *vertebral* and *invertebral* animals; the former of which subdivides, more regularly than the latter, into the *warm-blooded*, containing the mammalia and birds, and the *cold-blooded*, which embraces the genera of reptiles and fishes. The invertebral animals break into five genera, anatomically considered, each of which has its distinguishing marks laid down with considerable precision; they are, the *mollusca*, *crustacea*, *insects*, the *terrestrial worms*, and the *zoophyta*.

Each of these genera is again divided into its several species.

which we shall not here follow : in fact, for the general purposes of arranging facts and assisting observations, almost any classification of the animal kingdom, hitherto given, will answer the purpose with tolerable ease ; and perhaps the study of comparative anatomy is not yet sufficiently advanced to allow of a complete, luminous, and unexceptionable arrangement. This subject is further illustrated by very ample tables given at the end of the volume, which will immediately exhibit the division of animals adopted by the author.

The second Lecture is employed in a full general description of the organs of motion ; that is to say, the bones and muscles, and is divided into the several articles of, the intimate nature of muscular fibre ; the structure, composition, and growth of bone ; the articulation of bone ; the mechanical structure of tendons and muscles ; and general remarks on the skeleton.

The characteristic chemical property of pure muscular fibre is well known to be its perfect resemblance with the crassamentum after the colouring matter has been washed away, and this has been termed *fibrine* by the French chemists. The author notices the large proportion of azote which it contains, and the singular difficulty which occurs in accounting for its formation in herbivorous animals, whose food contains no sensible proportion of this principle. We do not think the author at all approaches to an explanation of this difficulty by referring it to the action of respiration in removing the hydrogen and carbon from the blood, and thereby augmenting the proportion of azote. With regard to the property of irritability, which resides in muscular fibre, the author adopts the opinion, now so generally received, that this is owing to the minute ramification of nervous filaments, which penetrate muscle beyond the reach of sight ; and he observes, that the animals which have not distinct and separate nerves, have no visible fleshy fibres, and in them irritability and sensibility do not appear to belong exclusively to any particular system of organs. Muscles do not necessarily require the presence of vessels and cellular substance, for the muscles of insects contain neither, and are only bundles of unadhesive, parallel, and simply contiguous fibres ; and yet they act with great strength. Colour is not necessary to muscles, as these organs are the same in the white as in the red-blooded animals. Several remarks on irritability are added ; and the following ingenious method, given by Humbolt, for distinguishing a nervous from a muscular filament, is mentioned. He employs two needles, one of gold and the other of silver, and applies the point of one to the muscle, and the other to the filament to be examined ; on bringing the other extremities of the needles in contact, the muscle will contract if the filament be a nerve, but not otherwise.

The description of the growth of the bones is clear and precise. On the progress of ossification, he remarks, that it is unequal both in different animals, and in different parts of the same animal. In man, and all the mammalia, the bones of the internal ear are not
only

only first ossified, but they surpass all others in density and in the proportion of calcareous phosphat. The bone of the cavity of the tympanum in the cetacea, particularly the whale and the cachalot, is superior in density and hardness to marble, and appears quite uniform in its section, shewing no vestige of fibres, cancelli, or vessels. In many animals the ossification is never compleat, as in the large class of fishes, which from this circumstance are called the *cartilaginous fishes*, or *chondropterygii*.

Several interesting remarks on horns, shells, and the indurated coverings of various animals conclude this article. Shells, he observes, are composed like bones of calcareous matter, intimately connected with gelatinous matter, but not constantly disposed in lamina. In some species, however, there are strata agglutinated to each other like leaves of pasteboard, which certainly increase with the growth of the animal, for these strata do not all exist in the young animal, but only the outermost, which is also the smallest. This is the case with the muscle, in which, when young, the shell is only a single stratum, and therefore is thin and brittle, but is, bulk for bulk, equally firm with the adult shell. During growth a succession of strata are added on the inner surface of the shell, each of which extends beyond the edges of the preceding strata, so that each operation of this kind adds to the length, breadth, and thickness of the shell.

Examples of most of the kinds of articulation are to be found in human anatomy, and the same may be observed of the mechanical structure of tendons and muscles. The tendons of the crustacea, however, in the muscles of the thighs and limbs, differ from those of the red-blooded animals in being hard, elastic, and not apparently fibrous. This tendon is often articulated with the scaly case which it has to move, in the same manner as one bone is articulated with another, and is then connected by a membranous ligament. The great claws of the cray-fish afford an example of this kind. The tendons of the mollusca are not apparent. This chapter concludes with general remarks on the skeleton, and an enumeration of principal points of resemblance and difference which are found in the various subjects of Comparative Anatomy.

Having thus prepared his Readers by a view of the most important general features of the interesting subject before him, the author proceeds to the individual description of parts, and the minutiae of Comparative Anatomy.

This may truly be considered as the most valuable part of the work; but the very nature of it renders it impossible for us to do more than give the contents of the several chapters, and a specimen of the mode in which this part is executed; for, a regular series of close condensed description, of all things, the least admits of an abstract.

In the third Lecture the author describes the organs of motion (that is, the bones and muscles) of the trunk; in the fourth lecture, those of the anterior extremity or pectoral member; and in the fifth, the posterior extremity or abdominal member. The plan pursued in these chapters is truly *comparative*, as the author first describes

the parts as they exist in man, and then proceeds to the same or similar parts in the other mammalia, in birds, and in reptiles; and the corresponding anatomy of fishes is subjoined. Besides the common form of anatomical description, the author takes occasion to introduce several comparative tables illustrative of the subject, such as, of the number of vertebræ in different animals, of the comparative length of the spine in the mammalia, &c. &c.; and he at times increases the interest of the description by observations on the peculiar uses of parts, and their adaptation to the mode of life which the animal is destined to pursue.

In the sixth Lecture, the comparison with the human subject is necessarily dropped, as in it the organs of motion in animals without vertebræ are described. This part is, perhaps, more curious than the other, as it is somewhat less familiar to general students, and includes several of those singularities of structure, which, from their novelty, excite surprise and wonder; at the same time it should be remembered, that as it is the most imperfectly known, and the most remote from analogy with our own species, its utility to the common student of anatomy is less than the former part, whatever it may be to him who pursues this difficult path with a view of discovery.

The mollusca are divided into the *Cephalopoda*, in which the head is furnished with tentacula that serve the purpose of feet, as is seen in the sepia or cuttle fish; the *Gasteropoda*, which have the head free and crawl upon the belly, of which the snail is a familiar example; and the *Acephala*, such as the oyster, in which there is no distinct head. It is only the organs of motion in the animals that are here described, those of sense being referred to another part of this work. We shall give part of the author's description of the organs of the cuttle fish, one of the cephalopoda.

"The cephalopoda have eight conical feet, of different lengths, arranged in a circle at the top of the head round the mouth. The animal can turn and bend them in every direction, and fasten itself to bodies by help of the cups or suckers with which they are furnished. The muscles which perform these motions are very numerous. — Below the skin we find a very thin muscle, the fibres of which are united by a loose cellular substance. It accompanies the skin in all its different shapes, and may, perhaps, be regarded as a *musculus subcutaneus*, employed to corrugate the skin, and give greater force to the muscle situated within it, and upon which it acts as a girdle." After describing the other muscles of the foot with its terminating sucker, he adds, "When an animal of this kind approaches any body with its suckers, in order to apply them more intimately, it presents them in a flat or plain state; and when the suckers are thus fixed by the harmony of surfaces, the animal contracts the sphincter, and forms a cavity in the centre which becomes a vacuum. By this contrivance the sucker adheres to the surface with a force proportioned to its area and the weight of the column of air and water of which it constitutes the base. This force multiplied by the number of suckers, gives that by which all

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or a part of the feet adhere to any body. This power of adhesion is such, that it is easier to tear off the feet than to separate them from the substance to which the animal chooses to attach itself."

This chapter concludes with the curious organs of motion of the insects, vermes, and zoophytes.

In the seventh and last Lecture of the first volume, the subject of the organs of motion is properly concluded, by a view of the effects resulting from the united action of these organs, whereby the circumstances of standing, walking, seizing and climbing, leaping, swimming, and flying, are produced. Some of the peculiarities in each of these actions possessed by certain classes of animals are also pointed out. Thus, in standing, the structure of birds that enables some of them to remain so long on one leg unfatigued is explained in the following manner: "There are some animals in which certain articulations are maintained in a state of extension, in consequence of their particular form, and the ligaments attached to them. The *flock* affords an example of this. The surface of the femur that articulates with the tibia, has in its middle a depression which receives a projection of the latter bone. In bending the leg, this process is lifted out of the depression and removed to its posterior edge. By this motion the ligaments are necessarily more stretched than during the extension of the leg in which the process remains in its socket. These ligaments, therefore, preserve the leg extended in the manner of some springs, without receiving any assistance from the muscles."

The method in which the active muscular exertions of different animals are performed is described with equal clearness, and terminates the volume.

[To be concluded in our next number.]

Practical Observations on the Inoculation of Cow Pox, pointing out a Test of a Constitutional Affection in those Cases in which the local Inflammation is slight, and in which no Fever is perceptible: Illustrated by cases and plates. By JAMES BRYCE, Member of the Royal College of Surgeons, Edinburgh, &c. and one of the Surgeons to the Institution for the Gratuitous Inoculation of Cow-Pox. Edinburgh, 1802, pp 236. 8vo.

THE greater part of this work is a compendium of the principal facts that have been observed on this interesting topic, selected principally from the several publications of Dr. Jenner, to whom the author gives the eulogium which the inventor of Vaccine Inoculation so well merits. After the numerous publications on Cow-pox which have been laid before the world, it would be needless to recapitulate the contents of the present work; it will be sufficient to observe, that the selection is made with elegance and judgment, and that the relative importance of each circumstance is preserved by receiving a proportional share of notice, so that, as a compendium, this publication yields in value to none.

The author, however, does not appear before the public as a mere compiler, but gives some observations which assume a claim to originality. These we shall briefly notice.

Those who have attended to the history of this disease, will doubtless recollect the event of the first experiments made by Dr. Woodville, in the Small-pox Hospital, and the number of severe pustular eruptions that occurred in this place, which seemed at first to give a very different character to the disease from that which Dr. Jenner had represented. They will also remember, that in subsequent observations, Dr. Woodville made it fully appear from numerous experiments, which it is needless to recapitulate, that the matter of small-pox does not *hybridize* with that of cow-pox; but that the occurrence of variolous-like eruptions during vaccine inoculation is in all human probability, owing to the effect of a variolous atmosphere operating on the patient, who, in the earlier stages of vaccine inoculation, is still unprotected from the effect of variolous contagion. These observations Dr. W. published in 1800, in a separate pamphlet; and subsequent remarks by different medical observers have pursued this idea a little further, and have shewn, in a very decided manner, that these eruptions are truly variolous, whilst the inoculated pustule remains vaccine. We think, therefore, it was hardly necessary for the author of the publication before us, after giving the result of Dr. Woodville's first experiments, to announce his own explanation of them in the following terms. "I am of opinion, that on attentively considering the circumstances under which it was formed, and comparing those with what has occurred to myself and others employed in cow-pox inoculation, I shall be able to evince, that the severity of the symptoms was entirely owing to causes quite unconnected with cow-pox;" when we find the explanation to be simply, that the eruptive pustules were variolous, whilst the inoculated pustule remained vaccine.

On the subject of preserving vaccine matter, which has so often disappointed medical practitioners, the author proposes, as a new method, "To have a small phial made for the purpose, having a long stopper which reaches nearly to the bottom. This stopper is ground at the upper part, so as to fit the mouth of the phial as exactly as possible, and that part of it which is within the phial is formed into square surfaces which are numbered. Upon these squares the virus is lodged, and when dry, is, with the stopper, put into the phial, where it is very compleatly secured from the action of the external air."

This method is ingenious, and probably as efficacious as any other. We have already seen it practised with success.

The title page of the present work promises a *test of constitutional affection*, a desideratum of the utmost consequence, and to this part we shall particularly direct our reader's attention. Cases will unquestionably occur, in which, after the whole progress of the inoculation is gone through, it still remains a doubtful point, whether the security against future small pox contagion is compleat. The author observes, with great force and justness, that the conducting of inoculation for the cow-pox has been considered as of so trifling a nature as scarcely to deserve the attention of medical men, and hence has arisen much disappointment and want

want of success: for though, *as a disease*, the inoculated cow-pox may be regarded as trifling, yet as a certain preventive of one of the most loathsome and fatal distempers that affects the human race, it deserves the most minute attention. But here it unfortunately happens, that it is much more difficult to ascertain a constitutional affection in this disease than in inoculated small-pox, so that the very mildness of the vaccine disease, in this point of view, may be considered as a disadvantage.

In order, therefore, to ascertain this important point, on which rests the whole of the efficacy of the inoculation, the author has applied to the present instance, some experiments which have been at times made during variolous inoculation. It is well known that if during this process, the same person is inoculated every day until the fever induced by the first inoculation supervenes, all the other punctures will advance with increased rapidity in their progress; so that the puncture which has been made only for twenty-four hours, will, at this period, equal in maturity the original one which had been made eight days before.

Pursuing this idea, the author applied it to the vaccine inoculation, and by a series of accurate, and, in this view, very curious experiments, (for the detail of which we must refer to the work itself) he found that in cow-pox, in which the characteristic areola takes place about the eighth day, if a second inoculation be performed as late as the fifth or sixth day, it will be so much accelerated in its progress as to have an areola formed within a few hours after the first, increasing with its increase, and fading as it fades.

This second inoculation he also found would run a parallel course with the first, whether there was general fever or not, and this is precisely the case in which a criterion for determining constitutional affection is the most wanted.

The author gives the particulars of fourteen cases, in which the second inoculation was performed; and by varying the time of performing it, a series of perfectly conclusive and satisfactory experiments is presented to the reader, which are also illustrated by two very well executed plates. From these it is concluded, "that the most proper time for performing the second inoculation, is about the end of the fifth or beginning of the sixth day from the first inoculation. If the second inoculation be delayed beyond the sixth day, the affection produced by it will be very indistinct, and of short duration; and, if performed at an earlier period than the fifth day, the contrast between the progress of the two affections, with regard to duration, will not be so great as may be thought necessary. So that, in order to obtain the proposed criterion in the greatest perfection, the second inoculation should be performed between thirty-six and forty-eight hours before the areola of the first inoculation is expected to appear.

"Where the first inoculation is accelerated or retarded one or two days, as frequently happens, then the second inoculation should be performed at a more early or late period accordingly."

The author adds, that if the second inoculation is not accelerated, but proceeds in the usual course, it will prove that the first was not necessary to produce the constitutional effect, and therefore that a third should be performed, as a counter proof of the efficacy of the second.

We have thus given the particulars of the author's proposed plan, as it certainly deserves the attention of medical men who practice vaccine inoculation. We hardly think, however, that it is fitted for general use; partly, because it increases the trouble of the operation, inasmuch, as it would require, in many cases, a second supply of vaccine matter to be procured four or five days after the first, which in private practice and country situations is not always easy to be insured. Likewise, if the second inoculation should fail altogether, whilst the first went through its regular progress in the most satisfactory manner, the author would probably ascribe this failure to a defect in the virus, which unfortunately so often disappoints the expectations of all parties concerned; but would he then suggest a doubt on the mind of the parents or friends of the patient of the validity of the first operation, on account of the failure of the counterproof? or though *he* should not hesitate to pronounce the security of his patient from future variolous infection, would *they* remain perfectly satisfied after they had seen the experiment fail, which he had himself instituted for his and their satisfaction?

Lastly, we may add, that in delicate irritable children, where already one, or perhaps two pustules are approaching to their state of highest inflammation, it might not be altogether safe to increase the only part of the vaccine disorder in which any risk is incurred, namely, the local inflammation.

However, the plan merits every attention, and the author certainly deserves well of the benevolent cause in which he is so actively engaged.

An Historical Account of the Discovery and Education of a SAVAGE MAN, or of the first Developements, physical and moral, of the young Savage, caught in the Woods near Aveyron, in the Year 1798; by E. M. ITARD, Physician to the National Institution of Deaf and Dumb, &c. Translated by Dr. John Reid, 1802, price 3s. 6d.

We have little to learn concerning the manners, the habits, and the faculties of a man in every state of *Society* from the rudest to the most polished; the indefatigable zeal of travellers has introduced us to the kraals of the Hottentot, and the subterranean huts of the Esquimaux; and the manners of savage society have long afforded food for reflection to the civilized philosopher. But to complete our knowledge of the powers and resources of the human animal, we must take a solitary individual of the species, deserted by, or deprived of, his natural protectors at an early age, seeking the same shelter as the wild animals of the forest, procuring his subsistence by the unassisted powers of his body, and thus following only his natural instincts, forlorn, friendless, and self-dependent.

What

What speculative philosopher could ever venture to propose such an experiment? and how great must be the chances against a child, thus situated, struggling through the helpless years of infancy!

Such an interesting subject for the moralist, the physiologist, and the man of reflection, has, however, actually occurred; and the instance which we have just supposed, is not hypothetical, for all these circumstances appear, on the strongest presumptive evidence, to unite in the person of the boy who was brought to Paris about three years ago, under the name of *The Savage of Aveyron*.

The narration which begins this little work, is perfectly simple. "A child about eleven or twelve years of age, who had been seen some time before in the woods of Caune in France, looking after acorns and roots, upon which he subsisted, was met in the same place, towards the close of the year 1798, by three sportsmen, who seized upon him at the instant he was climbing a tree to evade their pursuit. They conducted him to a neighbouring village, and put him under the care of an aged matron, from whom, however, before the end of a week, he contrived to escape, and fled to the mountains, where he wandered about during the severity of a most rigorous winter, clad only in a tattered shirt. At night he retired into solitary places, approaching, as the day advanced, the neighbouring villages; and in this manner he passed a vagrant kind of life, till the time in which, of his own accord, he sought refuge in a dwelling-house in the canton of St. Semin." From hence, we are informed, he was removed to two or three different places, during which time he appeared wild, capricious, and impatient of restraint, till at last he was sent to Paris, and finally placed under the care of the Author, who is the superintendant of the Hospital for the Deaf and Dumb, one of the most excellent and benevolent institutions for its extent in that large metropolis.

Here then begins the subject of the interesting history before us, which is, to relate the manners, habits, bodily constitution, and above all, the degree of reason shewn by this unfortunate foundling, of whom we may say, with the Poet,—

Earth was his bed, the boughs his roof did frame,
He knew no beverage but the flowing stream:
His food the fruit with which the woodlands teem,

The same to him glad Summer or the Winter breme.
So passed his youthful morning, void of care,
Wild as the colts that through the commons run.

The expectations that were first formed on his arrival at Paris, were such as strongly to awaken public curiosity; even persons of superior understanding seemed to have expected to find in him a lively, intelligent child, full of activity and observation; and they anticipated the pleasure of observing his astonishment at the splendour of the capital.

What was their disappointment at finding only "a disgusting, slovenly boy, affected with spasmodic, and frequently with convulsive motions, continually balancing himself like some of the animals in the menageries, biting and scratching those who con-

tradicted

tradicted him, expressing no kind of affection for those who attended upon him; and, in short, indifferent to every body, and paying no regard to any thing."

Hence it was that, though many people of all denominations, at first flocked to see such a novelty as a *wild boy*, the public curiosity was soon satisfied; it presently ceased to be the *fashion* to visit the savage of Aveyron, and he might have been abandoned to neglect, if, fortunately for him, he had not found in Mr. Itard, a patient, kind, and truly paternal guardian, who appears to have devoted much of his valuable time to the laborious and almost hopeless task of softening the untractable spirit, and rousing the dormant faculties of this wild and uncouth child of Nature.

The Author proceeds to explain the plan which he laid down, in order to begin the education, civil and moral, of his singular pupil. The plan is truly philosophical: the success resulting from the labour of two years has been but partial; enough, however, as it should seem, to encourage his kind guardian to persevere in a course, every step of which affords so much matter for interesting reflection.

We shall not, however, pursue further our account of this little volume, as it will doubtless be perused with eagerness by all who can feel the interest arising from such a curious subject. We cannot help remarking, however, how strongly the love of natural objects, and the force of early impressions recurred at various times to this untaught youth. Who can read without emotion the following paragraph!—"I took him, not long ago, to the Vale of Montmorency. It was a very curious and exceedingly interesting spectacle to observe the joy which was painted in his eyes, in all the motions and postures of his body, at the view of the hills and woods of this charming valley. He spent two days at a rural mansion; such here was the influence of his mind, arising from the exterior agency of these woods and these hills, with which he could not satiate his sight, that he appeared more than ever restless and savage; and in spite of the most assiduous attention that was paid to his wishes, and the most affectionate regard that was expressed for him, he seemed to be occupied only with an anxious desire of taking his flight,—rising from table every minute, he ran to the window with a view of escaping into the park."

It has been supposed that this boy is naturally deficient in his understanding, and that he can never be made more sagacious than an idiot, who may be trusted to his own guidance in common things. No pains have hitherto succeeded in giving him the use of language, excepting in the pronunciation of one or two simple sounds; however, Mr. Itard alleges with some force, that he expresses his simple wants so completely by signs, as to render speech unnecessary. One or two of these may entertain the reader. "Is he impatient to dine? He himself lays the cloth on the table, and presents Madame Guerin (his governess) the plates, that she may go into the kitchen to fill them. When he dines with me in town, all his wishes are expressed

expressed to the lady who does the honour of the table. It is always to her that he addresses himself to be served with what he wants. If she pretend not to understand him, he puts the plate by the side of the dish of which he desires to partake. If this do not produce any effect, he takes a fork and strikes it two or three times on the edge of the dish. If she still neglect him, he loses all patience, he plunges a spoon, or even his hand into the dish, and in the twinkling of an eye he empties it all into his plate."

It seems, likewise, that he has not yet learned politeness, for "a great number of the curious know how, with more natural frankness than politeness, he dismissed them when fatigued with the length of their visits; he presents to each of them, and yet without a countenance of contempt, their cane, gloves, and hat, pushes them gently towards the door, which afterwards he violently shuts upon them."

The author concludes the work by remarking, that the important period of puberty is just approaching by the most unequivocal signs. The physiologist will probably expect, that if any material advance is ever to be made in raising the intellect of this youth to the level of that of his fellow men, it will be effected along with the growth of his bodily powers.

A Practical Synopsis of the Materia Medica, by the Author of *The-saurus Medicaminum*, Vol. I. containing Part I. *Materia Alimentaria*, and the First Class of Part II. viz. *Evacuantia*, 8vo. pp. 323. London, 1797.

We have introduced the mention of this work, though published so long ago, for the sake of correcting an error at page 564 of our 7th volume. We there mentioned the 2d vol. of this work, as being a Continuation of *The-saurus Medicaminum*, which is a distinct Treatise. The commendation we bestowed on the other parts, may, with propriety, be applied to the present.

An Historical Sketch of the Controversy upon Apoplexy, &c. by R. LANGSLOW, M. D. 8vo. pp. 52, 1802. London.

As the subject of this work has been very fully laid before the public in our Journal, and even a great part of the work itself, (for several letters, &c. are here reprinted from the Journal) our Readers will not expect us to give extracts. And as we observe among our correspondents, a much greater diversity of opinion respecting the pathology of apoplexy than we expected, we avoid giving any other opinion on the present work, than that it appears to be as fair a sketch of the Controversy, as could be expected from a writer who had been so warmly engaged on one side.

A Synopsis, and an Explanation of the Synopsis, of Chemical Nomenclature and Arrangements; containing several important Alterations of the Plan originally reported by the French Academicians; by SAMUEL MITCHILL, M. D. Professor of Chemistry in Columbia College, &c. pp. 44. New-York, 1801. London.

It is an evil common to all revolutions which overturn established principles, to go too far. When the French chemists thought it right to revolutionize chemistry, they created a new language, so adapted to the new principles, that the one cannot vary without the other. Now, if chemistry had arrived at perfection when the new language was made for it, there would be no other cause for regret, than its rendering all previous works obsolete. But when every day presents us with some new discovery, or the correction of some error that affects the elementary bodies, or the first principles, it is to be lamented that an entire new language should have been proposed so early. We think the temperate *reformation* adopted by the admirable Kirwan, would have been preferable to a *revolution*. The revolution, however, has been received in Europe, and the new Nomenclature is become familiar to us; but Dr. Mitchill is not entirely satisfied with it; and in the work before us, proposes a few new terms. We think that the progress of Science is retarded by frequently changing the language of it; and we shall think it a cause of regret, if America and England should use different languages in the science of chemistry. As we can give no intelligible account of this work, without giving the Synopsis itself, we shall content ourselves with mentioning a few of the names proposed to be used instead of the current ones. For Caloric, Anticrouon; Hydrogen, Phlogiston; Azote, Septon. The other terms differ little from those in general use.

The Medical Quærist and Investigator, by W. P. RUSSEL. 8vo. pp. 13. London, 1802.

THE design of this short pamphlet is to instruct the young student in medicine how to make the inquiries necessary to inform him of the true nature and danger of any disease. It will also much assist any patient in the country to draw up his own case for the purpose of consulting a practitioner at a distance. As the price is small, we shall be surpris'd if every medical student does not possess himself of it.

MEDICAL AND PHYSICAL INTELLIGENCE.

[FOREIGN AND DOMESTIC.]

Sir JOHN SINCLAIR, in his Essay on Longevity, wishes the following Questions to have an extensive circulation, and invites all persons, as far as their experience and observation will admit, to answer them with minuteness and accuracy.

1. What is the effect of the climate in which you reside, on the health and longevity of the human race?

2. What form is reckoned most conducive to health and longevity?

3. Is it found, that being descended from young and from healthy parents, is essential for good health and old age?

4. Is it found, that health and old age depend much on the disposition or temper of the individual?

5. Is there any perceptible difference in consequence of situation of life?

6. What professions are reckoned favourable to longevity, or otherwise?

7. Is exercise and moderate labour found necessary for preserving health and long life?

8. Have the long-lived in general been in the marriage state?

9. Have the greatest proportion of the long-lived consisted of males or females?

10. Have their been any instances of persons renewing their age, getting new teeth, new hair, &c.?

11. What are the other circumstances tending to promote long-life?

12. What is the effect of diet on health and longevity?

13. What are the effects of clothing?

14. What the effect of habitation, and the difference of living in a town or in the country?

15. What are the effects of habits and customs in regard to early rising, bathing, regular meals, regular sleep, and in particular, what are those minute circumstances on which it is supposed that health and longevity principally depend?

16. What are the rules regarding medicine, which are accounted the most useful and salutary?

17. What are the most remarkable instances of longevity, and how are they authenticated?

18. What are the rules adopted by those who have attained great age?

19. Have any tables of longevity been drawn up in your neighbourhood,

bourhood, and how do they agree with the one extracted from Hufeland?

20. Do any additional observations or particulars occur to you on the subject of health or longevity?

M. DUPUYTREN, chief of Practical Anatomy, has presented to the Medical School at Paris, a girl, aged 2 months 10 days, who came into the world only with a trunk: the situation of the lower extremities was marked by two small depressions; the place of the superior extremities was marked by small protuberances, that on the right side was more developed, so as to form a short arm. On dissection, all the muscles were found to terminate short of the stump; the humerus on the right side was complete, and terminated, at its lower extremity, by the usual articular surfaces. On the left there was found but the half, corresponding to the scapula; interiorly was found a portion of bone, which shewed that the formation of the femur was commenced.

We cannot but consider every *lusus naturæ* worth attention; they hold out lights to direct the Physiologist and Pathologist in their inquiries.

Paris has lately lost a very learned and ingenious physician, Xavier Bichat, a pupil of the celebrated Desfault. He was known by various works of great merit, and he is extremely regretted in this country. He has published a book much esteemed, and the only one of the kind yet existing in Physiology, *On Life and Death*. He was preparing for the press a new edition with considerable improvements. He is also the author of a *Treatise on Membranes*, wherein they are classed in a new manner. He published 4 volumes on *general*, and has written two on *descriptive*, Anatomy. It is believed that the two last on this branch of science are now in press. When he died, he was preparing a work on *Pathological Anatomy*. Besides these original works, he has given a new edition, enriched with many alterations and additions, of some works of his master Desfault, viz. *Diseases of the Urinary Passages*; *Surgical Journal*; and *Surgical Works*. In consideration of his merit and excellence, Bonaparte, in a letter, dated Thermidor 14, year 10, requests Chaptal, Minister of the Interior, to cause a marble to be erected in the Hotel Dieu, to the memory of Desfault and Bichat, "On account, says he, of the services they have rendered; the first, to French Surgery, of which he is the restorer; the second, to Physic, which he enriched with many useful works. Had not Bichat fallen, at twenty-eight years of age, a victim to merciless death, he would have extended the dominion of Physic, that Science so important and so beneficial to humanity."

Mr. READ has invented a pneumatic apparatus, the whole of which may be made for less than a guinea, and may be introduced to the bed-side of the patient, who, by turning a cock, may take an inspiration of the gas as often as he pleases.

M. Dæ

M. DAMART, of St. Omer, proposes a new method of purifying vegetable oil. He mixes with 100lb. of oil 25 oz. of rock alum, dissolved in 9lb. of boiling water, then stirring it for about half an hour, he adds 15 oz. of nitric acid, still continuing to stir it, and after it has stood 48 hours, the pure oil swims on the surface, and may be drawn off.

Professor ROBISON is about to publish a Chemical Lecture of the late celebrated Dr. Joseph Black, Regius Professor of Chemistry of Edinburgh, from the author's manuscripts, with Notes, philosophical and historical, by the Editor; partly to illustrate the Text, and partly to ascertain the claims of Dr. Black, and other eminent philosophers of these kingdoms, to the great Discoveries and Improvements which have been made in Chemistry since the Year 1756.

Proposals are circulated for publishing by Subscription, (for the benefit of the Author's Children) A Course of Lectures on ZOO-NOMIA, or the Laws of Animal Life, by the late Thomas Garnet, M. D. formerly Professor of Natural Philosophy and Chemistry in the Royal Institution of Great Britain; dedicated, by permission, to the Right Honourable and Honourable the Managers of that Corporation; and allowed to be printed at their press. In this Course a popular view is given of the Animal Economy, and the laws by which its different functions are regulated, with the methods of preventing and curing diseases. The principal object has been to render this Course interesting, not only to students of medicine, but to all who think the study of the human frame a subject worthy their inquiry. The Course consists of fourteen Lectures, and will form one handsome quarto volume.

Subscriptions are received by Messrs. Bosanquet and Co. 73, Lombard-street; Messrs. Coutts and Co. 59, Strand; and by Mr. Savage, at the house of the Royal Institution, Albemarle-street.

THEATRE, LONDON HOSPITAL.

Mr. HEADINGTON and Mr. FRAMPTON will commence their Lectures on Anatomy, Physiology, and the Principles and Operations of Surgery, on Friday the 1st of October, at nine in the morning.

Anatomical Demonstrations and Dissection, by Mr. ARMIGER.

During the Winter, a Series of Lectures on Surgery, illustrated by cases under treatment, will be given to the pupils of the Hospital by Mr. BLIZARD, Mr. T. BLIZARD, and Mr. HEADINGTON.

Dr. DENNISON will also commence his Lectures on the Theory and Practice of Midwifery, on the 1st of October, at eleven in the forenoon.

Dr. JAMES CURRY, Assistant Physician to Guy's Hospital, has been unanimously elected one of the Senior Physicians to said Establishment, in the room of Dr. Harvey, resigned.

Dr.

Dr. JAMESON'S Clinical Lectures will commence on the 12th of October, at the Finsbury Dispensary, St. John's Square; and a Lecture will be delivered on Tuesday, Thursday, and Saturday in every week, between the hours of 11 and 12 o'clock; one of these will be on the Principles, and the other on the Practice of Medicine, alternately: After each Lecture, an hour and an half will be set apart to examine the patients of the Dispensary.

Dr. BRADLEY (removed from Delahay-street to Parliament-street) will commence his Autumnal Course of Lectures on the Theory and Practice of Medicine, on Monday, October 4, at the Lecture Room, No. 102, Leadenhall-street, at six in the afternoon.

Mr. THOMAS will commence his Winter Course of Lectures on the Principles and Operations of Surgery, on Friday the 8th of October, at seven o'clock in the evening.

Further particulars may be known at his house in Leicester Square, or at the Anatomical Theatre, Windmill Street.

TO CORRESPONDENTS.

Beta's favour is better suited to some of the Theological Repositories.

ERRATA.

- Vol. v. p. 258, l. 36, *for outer, read other.*
 Vol. vi. p. 356, l. 40, *after performed, add, in spite of the art.*
 ——— p. 435, l. 25, *read we shall see in a moment.*
 ——— p. 437, l. 22, *read OR IF YOU LIKE, of a kind of, &c.*
 Vol. viii. p. 41, l. 4, *from bottom, for Preston, read Oreston.*
 ——— p. 43, l. 27, *for House Surgeon, read Navy Surgeon.*
 ——— p. 288, l. 14, *(Dr. Pole's Lectures) for Evening, read Morning.*
 ——— p. 352, l. 33, *for timeous, read timely.*
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ADVERTISEMENT.

Persons who reside abroad, and who wish to be supplied with this Work every month as published, may have it sent to them, FREE OF POSTAGE, to New York, Halifax, Quebec, and every part of the West Indies, at three guineas per annum, by Mr. THORNHILL, of the General Post Office, at No. 21, Sherborne Lane; to Hamburgh, Lisbon, Gibraltar, and every part of the Mediterranean, at three guineas per annum, by Mr. BISHOP, of the General Post Office, at No. 22, Sherborne Lane; to the Cape of Good Hope, or to any part of the East Indies, at two guineas per annum, by Mr. GUY, of the India House; and to any part of Ireland, at two pounds ten shillings per annum, by Mr. SMITH, of the General Post Office, at No. 3, in Sherborne Lane. It may also be had of all persons who deal in Books in every part of the world.

[W. Thorne, Printer, Red Lion Court, Fleet Street.]

M^r. BERNARD'S

Instrument

(Vide Page 387. Vol. 8.)

Fig. 2.

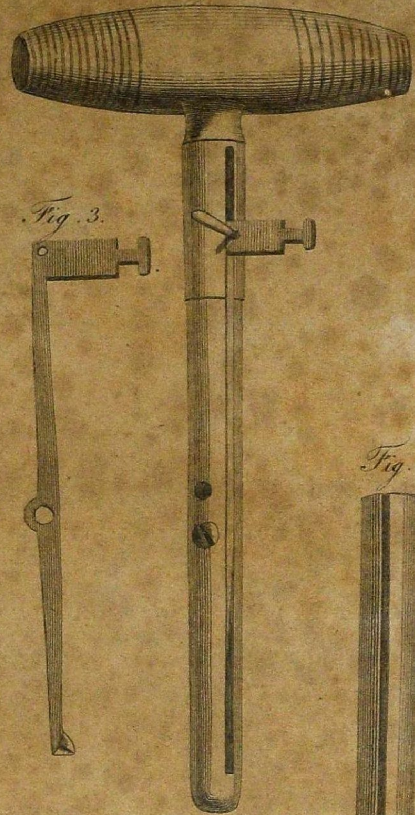
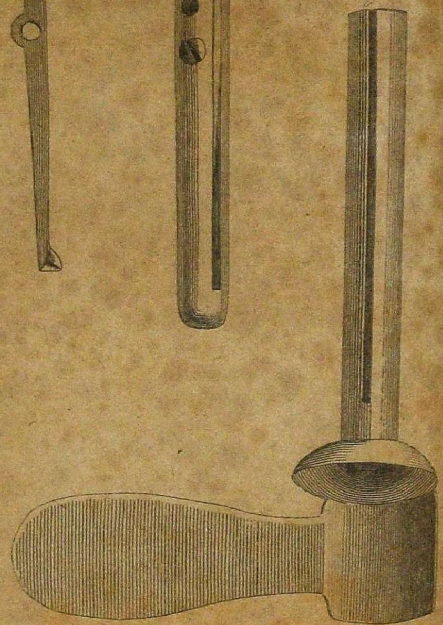


Fig. 3.

Fig. 1.



GUERIN'S

Porte-Conducteur

(Vide Page 385. Vol. 8.)

