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On Delivery in certain difficult Cases of Arm-presentation;
by JOHN SIMS, M. D.

IT has been considered as a general rule in the practice of Midwifery, that, when the arm presents, except the head is at the same time descending into the pelvis, the child must be turned and brought by the feet; and for a long time it was supposed that a full grown child, in such a situation, could never by any effect of the labour-pains be expelled; but Dr. Denman first observed that there were exceptions to this, and that a child presenting with the arm, might, by the long-continued action of the uterus, be so turned about, that the breech should come down, and thus the delivery be completed without assistance from art. There is no doubt but that this spontaneous evolution has sometimes really taken place; experience has however shewn, that it is by no means to be depended upon, and the rule of the necessity of turning a child presenting with the arm is generally acted upon, and I believe with great propriety, in those cases where the practitioner is in attendance sufficiently early after the membranes have been ruptured, to allow of the operation of turning being performed with tolerable ease. But it sometimes happens that from neglect in the beginning,* the child is suffered to remain in this unfavourable position so long after the discharge of the liquor amnii, that the uterus contracts so strongly round the body of the child, that the operation of turning becomes extremely difficult, and cannot be performed without using so much force as will not unfrequently prove even fatal to the mother. Every experienced practitioner knows that there are cases of this kind, in which the difficulty of turning is extreme; and although long-continued efforts, dexterously applied, will generally in the end succeed, yet the event

* It must be confessed, that although neglect in the beginning is the most usual cause of these difficult labours, it will sometimes happen that from the rupture of the membranes before the commencement of labour, the ensuing difficulty must be in great measure unavoidable.

event is so often unfavourable, that these forcible deliveries are always to be dreaded; and the more experience a man has, the more he wishes to avoid the necessity of turning under these circumstances.

It will be remembered that I am speaking only of such cases where this operation cannot be performed without great violence, for it sometimes happens even when the waters have been very long discharged, that the uterus acts with so little force that the turning may be effected with tolerable ease and great safety to the patient.

In the cases I am speaking of, the previous death of the child is for the most part certain from the concomitant circumstances; the practitioner has therefore nothing to consider but how he can bring it away with the least pain and hazard to the mother. Many years ago, in a conversation with several experienced practitioners on this difficulty, I remember to have heard Dr. Garthshore recommend the severing the head from the body of the child, which he represented as having easily performed with the assistance of the blunt hook only; an operation mentioned by Heister, as newly invented in his time by one Horne, and long before by Celsus*. Dr. Denman, in his excellent Introduction to the Practice of Midwifery, speaks of this mode of delivery; but not having had any experience of it himself, passes it over slightly. Soon after the above-mentioned conversation I was called to a woman, who had been several days in labour with an arm-presentation. She had been from the first attended by a gentleman advanced in life, but of little experience in this branch of his profession, having spent most of his time as a surgeon in the navy. Having been a pupil of Dr. Wm. Hunter, he had imbibed a notion that Nature, if unmolested, was in every case adequate to the delivery of the child; he had not of course, as he assured me, attempted to give any manual assistance. This case was therefore favourable for the spontaneous evolution

* Heister, *Cap.* 153. *Seç.* 9. "Si vero transversus est, neque dirigi potuit, unco alie injiciendus paulatimq; attrahendus est. Sub quo fere cervix replicatur retroque caput ad reliquum corpus spectat. Remedio est *cervix præcisa* ut separatim utraq; pars auferatur. Id unco fit qui, priori similis, in interiori tantum parte per totam aciem excutitur. Tum id agendum est, ut ante caput, deinde reliqua pars auferatur: quia fere majore parte extracta caput in vacuum vulvam prolabitur extrahique sine summo periculo non potest." Celsus, lib. 7, c. 29.

This direction to take away the head first and afterwards the rest of the body is hardly practicable, and from what I have seen appears to be unnecessary; the difficulty and danger of delivering the head, always indeed proportionable to the deformity of the bones of the pelvis, being greater in imagination than in reality.

evolution to have taken place, but unfortunately nothing of the kind happened.

When my assistance was demanded I found the woman apparently dying, the arm and shoulder of the child intirely without the os externum, and the uterus so closely contracted round its body, that having no hopes of saving the life of the mother, any attempt at turning was intirely out of the question; yet being desirous of finishing the delivery, for the sake of the women in attendance and the relatives of the patient, who are greatly more shocked at a woman's dying undelivered, than under any other circumstances, I thought it a good occasion to put in practice the operation recommended by Dr. Garthshore, and accordingly passed a blunt hook round the neck of the child, which was so low down as to be easily got at, and pulled forcibly, twisting at the same time with a view of separating the head from the body; but although the child was very putrid, the neck resisted a very considerable force sufficient to extract the child double as it was coming down, the head and thorax passing at the same time. Since this I have often been consulted in cases of arm-presentation, where the waters had been long discharged, and the uterus in consequence very closely contracted round the body of the child; in some of these cases, long continued efforts have at length succeeded in turning the child, but too frequently the event has been fatal; sometimes the uterus has been ruptured in the operation, and sometimes where this misfortune has not been known to have happened, the uterus has suffered so much that fever and death have ensued. The more experience I have had, the more I have been desirous of rather bringing away the child in any way I could, than running the risque of these very difficult turnings. Sometimes I have been able to get at the head, and with the perforator and crotchet have accomplished the delivery; sometimes calling to mind the spontaneous evolution of Dr. Denman, I have succeeded in imitating it by fixing the crotchet in the anus or groin, and now and then pulling by the arm, to get the thorax as low down as possible; I have perforated this, and getting away piecemeal whatever part presented, have divided the body in two parts; in this way awkwardly imitating Dr. Garthshore's operation; or passing the crotchet through the thorax and abdomen, have fixed it in the bones of the pelvis, and thus brought the breech down.

Having been lately called, in consultation with my friend and colleague Dr. Squire, in a case where the arm and navel-string presented, and the labour, under the management of a midwife, having been suffered to go on some days after the evacuation of the liquor amnii, the uterus was so firmly contracted round

round the body of the child, that turning could not but with the greatest difficulty have been accomplished. The Doctor having precisely the same ideas of the danger of turning in this case from the resistance the uterus gave to his first attempts, and the same experience of the greater safety of delivering by other means, we determined if possible to save the patient the danger of this operation; and having with some difficulty got at the neck of the child, we fixed a crotchet upon it, and guarding the point with the fingers on the opposite side of the neck, succeeded by degrees in separating the head; then taking hold of the arm, the body passed with the greatest ease, leaving the head behind, but so low down in the pelvis that it was easily extracted by a finger in the mouth, and thumb under the chin, without the use of any instrument, or the assistance of a labour pain. The child was not large, or the difficulty of separating the vertebræ of the neck by means of the crotchet would have been greater; it may however, I apprehend, always be accomplished with this instrument much easier than with the common blunt hook; but if filed to an edge on the inner side of the bend, this might perhaps be a very convenient instrument for such a purpose, and appears to be the very same as that recommended by Celsus.

As I do not know that any Case has been published in which the practice of Horne, as recommended by Heister, and since recommended by Dr. Garthshore, has been had recourse to, and the event being fully answerable to our expectations, I presume it will be thought worthy to be inserted in the Medical Journal.

In the above account I have purposely spoken of the uterus as being strongly contracted round the body of the child, without adverting to the nature of that contraction, as arising from the natural elasticity of the uterus, or from it's increased action in expulsive efforts or labour-pains; because, whatever be the kind of contraction, the nature of the difficulty is the same, varying only in degree. It may not be amiss, however, to repeat here what has been properly laid down by Dr. Denman, that whenever there are strong labour-pains present, turning ought not to be attempted, and that not only on account of the increased difficulty and danger of the operation, but because whenever there are strong forcing pains present, a favourable issue may under all circumstances be expected; for as if Nature felt her own inability to accomplish the delivery in cross-presentations, there are rarely any pains; and where these exist to a certain degree, I have always found that from the small size of the child, or, which amounts to the same, the large dimensions of the pelvis, the child was about to be expelled double, or that the head or breech were coming down with the arm, though not yet
within

within reach of the finger. Often, however, when there are no pains, whilst the patient is left to herself, the uterus is immediately thrown into strong action by the irritation which the attempt to introduce the hand must necessarily occasion, and this circumstance always adds to the difficulty and danger of the operation. It seems probable that opium, so frequently recommended to be given before the operation is commenced, may in this case be useful; I have not however been able to decide whether it is really so or not. Opium seems to me to increase the action of the uterus as exerted in labour-pains, although its irregular spasmodic action, producing pains resembling those of labour, is certainly diminished by it. But notwithstanding this irritability of the uterus, by proceeding with caution in the manner recommended by Dr. Denman, carefully avoiding all exertion of force during the action of the womb, the delivery may for the most part be safely accomplished, though with great trouble to the operator; for by repeatedly exciting the action of the uterus, its contracting powers become more and more languid, and at length frequently cease entirely, when the delivery may be accomplished with tolerable ease and safety. If, on the other hand, a strong man is determined, without regard to the resistance, to overcome every obstacle, he may succeed in his purpose, and that perhaps in a little time, but the event will be too frequently fatal.

JOHN SIMS.

Upper Guilford Street, May 1, 1802.

*Report from the Committee of the House of Commons on
Dr. JENNER's Petition, respecting his Discovery of Vaccine
Inneculation.*

THE Committee, to whom the Petition of Edward Jenner, Doctor of Physic, was referred, have, pursuant to the Order of the House, examined the Matter thereof; which is divided into Three distinct Heads of Inquiry:

The utility of the discovery itself, which is the foundation of the petition:

The right of the Petitioner to claim the discovery:

The advantage, in point of medical practice, and pecuniary emolument, which he has derived from it.

Upon the first head a number of witnesses of the highest characters, and most extensive experience in the profession, were examined, whose names, with the substance of their respective

spective evidence (strongly confirmed by their general practice, as well as by that in their own families) appear in the Appendix; nor was it for want of the testimony of many other equally respectable Physicians and Surgeons, whom the Petitioner was desirous of producing, that many other names are not inserted; but because Your Committee, after having received so considerable a body of evidence to the same purport, and with so little variation in opinion, thought that his case could sustain no injury in being left to rest upon the concurring depositions of those already examined, who had both the most ample experience of the facts, and the best means of forming an opinion upon them. The testimony also of some persons not professional has been admitted, who could speak to occurrences that tend to illustrate particular points connected with the subject. The result, as it appears to Your Committee, which may be collected from the oral testimony of these Gentlemen (with the exception of three of them) is, that the discovery of Vaccine Inoculation is of the most general utility, inasmuch as it introduces a milder disorder in the place of the inoculated Small Pox, which is not capable of being communicated by contagion; that it does not excite other humours or disorders in the constitution; that it has not been known, in any one instance, to prove fatal; that the Inoculation may be safely performed at all times of life (which is known not to be the case with regard to the inoculation of the Small Pox) in the earliest infancy, as well as during pregnancy, and in old age; and that it tends to eradicate, and, if its use becomes universal, must absolutely extinguish one of the most destructive disorders by which the human race has been visited.

The written evidence which is inserted in the Appendix (for Your Committee have judged it proper to make a selection from a great mass, of what appeared most important) is more various, but directed to the same objects: part of it relates to the very extensive and successful practice of this mode of inoculation in every quarter of the globe, the efficacy of which does not seem abated by the cold of the northern, nor the heat of the southern and tropical climates; and though there are no means of examining the authors from whence some of these attestations come, it would be an act of injustice to the Petitioner to exclude these important documents, which show the consideration in which this discovery is held, and the benefit with which it has been attended in so many other countries, to at least as great an extent as in our own.

As a comparison between this new practice, and the inoculated Small Pox, forms a principal consideration in the present Inquiry, some facts with regard to the latter engaged the attention

tention of Your Committee, and they have inserted in the Appendix (No. 44) statements of the mortality occasioned by the small pox in 42 years before Inoculation was practised in England, and of the 42 years from 1731 to 1772: the result of which appears to be an increase of deaths amounting to 17 in every 1000: the general average giving 72 in every 1000 during the first 42 years, and 89 in the 42 years ending with 1772; so as to make the whole excess of deaths in that latter period, 1742. The increase of mortality is stated by another witness (No. 4) to be as 95 to 70, comparing the concluding 30 years with the first 30 of the last century, and the average annual mortality from small pox to have been latterly about 2,000; for though individual lives are certainly preserved, and it is true that a smaller loss happens in equal numbers who undergo the small pox now, than there was formerly; yet it must be admitted that the general prevalence of inoculation tends to spread and multiply the disease itself; of which, though the violence be much abated by the modern mode of treatment, the contagious quality remains in full force. It deserves also to be noticed, that the deaths under the inoculated sort of small pox, with all the improvements of modern experience, are not inconsiderable; it is stated by one of the witnesses at about one in every 300 throughout England (No. 35); by another, as about one in every 100 in London (No. 38); while the loss in the natural small pox is probably not less than one in six (No. 37); nor ought it to be overlooked, that mistakes have been known to arise in the inoculated small pox, and instances are cited by some of the witnesses, in which persons supposed to have gone through the small pox by inoculation, have caught it afterwards in the natural way (Nos. 21 and 41); the general laws of vaccine and variolous disease are extremely similar, and it is not surprising that they should resemble each other in their anomalies.

A spurious or imperfect sort of Cow Pox having been mentioned in some of the examinations, Your Committee have been particularly diligent in their inquiries into every individual case that came within their notice, where suspicions had arisen, or facts were alleged, tending to bring into doubt the preventive power of Vaccine Inoculation; and although, for the reasons before given, they have restricted and abridged the proofs in favour of this practice, they have thought proper to withhold no part of the evidence that has been received relative to the cases that appear to controvert it; of which it will be observed that some (Appendix, Nos. 31, 32, and 33) evidently resolve themselves into variolous infection, taken previously to the vaccine inoculation; others (Appendix, Nos. 33, and 40) into the patient

not having taken the cow pox at all; others again (No. 25) from the vaccine matter being, by want of attention in preserving it, decomposed, or mixed with variolous matter, or from the fluid being taken at too late a period of the pustule; to which last cause it seems probable that most of the errors and dubious cases are to be referred (No. 20.) All the practitioners agree, that there is no difficulty in distinguishing the real disorder from any spurious or imperfect appearance; and that the regular progress of the pustule itself, if attended to, cannot be mistaken.

The cases (Nos. 45, 46, 47, 48, and 49) are not explained by any particular evidence applied to them in a satisfactory manner: but in leaving them to have such weight as they may appear to deserve; Your Committee cannot avoid recurring to the multitude of instances in which endeavours have been used to communicate the small pox to patients who have been known to go through the regular vaccine disease, in which neither repeated inoculations nor exposure to the most malignant small pox, have been able to produce any effect; Appendix (Nos. 6, 9, 16, 36.)

Upon the second head, the whole of the oral depositions, as well as all the written documents from abroad, are uniform and decisive in favour of Dr. Jenner's claim to originality in the discovery: but as some pretensions have been advanced to a knowledge at least of this practice before Dr. Jenner's publications, it may be proper to notice shortly, what the nature of those claims is, and in what manner they bear upon this part of the Petitioner's case. The extracts which can be considered as in any degree material, are contained in Appendix, (Nos. 50, 51, and 52.) The disorder itself, and its specific property of securing against small pox infection, was not a discovery of Dr. Jenner's, nor of any of those whose writings are referred to: for in various parts of England, in Gloucestershire and Devonshire particularly, there was an opinion of that sort current among the common people employed in Dairies, which the observations of inoculators for the small pox tended to confirm. It appears not improbable, that in some very rare instances this knowledge was carried one step farther, and that the cow pox was communicated either by handling the teat, or by inoculation from the animal for the purpose, and with the intention of securing against the danger of small pox: but the practice of which Dr. Jenner asserts himself to be the original inventor, is, the inoculation from one human being to another, and the mode of transferring, indefinitely, the vaccine matter without any diminution of its specific power, to which it does not appear that any person
has

has ever alleged a title: and the papers and experiments, whatever accuracy of observation, and spirit of research, they may evince in their respective authors, and to whatever extent they may be supposed to go, as they were never given to the public, so neither is there any intimation that they were imparted to Dr. Jenner; nor is it contended that the world became acquainted with this discovery, by any other means than by the course of trials conducted by the Petitioner, and by his ample and unreserved communications.

Upon the last division of the subject, the evidence of several persons has been received who were acquainted with the medical practice, and former situation of Dr. Jenner, Appendix (No. 40) which confirm the allegation contained in the Petition, that he has not only reaped no advantage from his discovery, but that he has been a considerable loser by the persevering attention which he has bestowed upon this one subject, to the neglect of his other business, without an opportunity of replacing himself in the situation which a desire of publishing and diffusing more extensively, and establishing beyond the reach of controversy the practice itself, induced him to quit. What his gains might probably have been, if he had been solicitous to keep the secret within his own practice, and that of his own immediate pupils, as far as medical men in great practice themselves can form a conjectural opinion, may be collected from the testimonies expressed in Appendix (Nos. 35 to 43) in which no more than justice is done to the liberality and public spirit of the Petitioner, in considering the propagation and extension of this important discovery, and in rendering it rather of universal utility to the human race, than of emolument to himself.

Dr. Edward Jenner begged leave to submit to the Committee, vouchers from correspondents in various parts of the globe, referring to at least one hundred thousand cases. Of these testimonials Your Committee have selected the most important, and annexed them in the Appendix to this Report.

Appendix to the Report from the Committee.

The Evidence delivered by each person is numbered for the sake of reference; but we give them in the order they are referred to in the Report, not in the order of the Appendix,

Dr. BLANE, F. R. S. and one of the Commissioners of sick and wounded Seamen, first heard of this discovery about ten years ago, but could not give credit to what seemed so extraordinary

dinary and romantic, but still he did not desist from making inquiries, as some of his children has suffered much from the small-pox. His inquiries led him to see how it was practised in the Inoculation Hospital, from whence he came away so much prejudiced against it, that he immediately inoculated one of his children with the small-pox. Soon after he found the opinions he had taken up, to arise from the vaccine having mixed itself with the variolous infection in this hospital; and his further inquiries ended in a perfect conviction of the merits of vaccine inoculation, insomuch that he inoculated another of his children with it, who went through the disease perfectly well, and has since resisted the variolous infection, which was attempted to be communicated seventeen months after the other. He attributes the discovery solely to Dr. Jenner. In his official situation he recommended to the Admiralty to have it tried on board the fleet, which was done, and in the Kent man of war all those who had received the vaccine inoculation, were afterwards inoculated with variolous matter, but without effect; that the Reports of all the Navy Surgeons were favourable to its operations; remarking, that the men, during the disorder, were not incapacitated from their usual duties; and so highly did they prize this discovery, that a meeting was held at Plymouth, where a gold medal was subscribed for by them, and presented to Dr. Jenner as its author. He laid before the Committee testimonials from Egypt, signed by Lord Keith and General Hutchinson, in its favour; his own opinion of its advantages, he draws from the comparison with the mortality occasioned by the small-pox, which, by computation, amounts to nearly one-tenth of the whole mortality in this country (95 out of every 1000 deaths reported in the bills); and that since the introduction of inoculation for the small-pox, the mortality occasioned by that disease has increased; that the number who die of the small-pox annually within the bills of mortality is about 2000, and in the United Kingdoms it may be computed at 45000; therefore if the vaccine was universally substituted, he thinks the small-pox must in a short time be extinct; he has heard of objections and prejudices against this method, but upon inquiry he has found them grounded on fallacy and misrepresentations; an instance of which occurred in the 10th regiment of dragoons, where he found the lancets used to have been confounded with others armed with variolous matter, which probably occasioned the report of small-pox infection having succeeded the inoculation with vaccine matter. He gave two or three other instances equally injurious to the practice of vaccine inoculation, which were evidently founded upon misapprehension. He believes most of these cases to have arisen from the using of matter taken at too late a period of the pustule, which may

may equally happen in inoculating for the small-pox with virus taken at an improper period of maturation. (No. 4.)

Dr. BRADLEY, Licentiate of the Royal College of Physicians, Physician to the Westminster Hospital, and one of the Conductors of the Medical and Physical Journal, is in correspondence with the Faculty on the Continent as well as in England; has received accounts of the progress of vaccine inoculation from New York and Philadelphia; from Paris, Malta, Italy, and Germany; from all which parts its excellence is confirmed, and it is now likewise introduced into Turkey. He laid before the Committee all the publications and papers he had received on that head. He looks upon Dr. Jenner as the author of the vaccine inoculation, and believes no medical man in the world doubts it; and in his extensive correspondence he has never heard any other person lay claim to it; he believes vaccine inoculation will prevent the small-pox to the extent of human life; for the natural cow-pox has already been proved to do so; and there have been decisive experiments made to prove that vaccine inoculation will mitigate the small-pox, when caught in the natural way. The spurious sort of cow-pox can be readily distinguished from the real, by an examination of the plates given as illustrations of the practice by Dr. Jenner; he thinks that if Dr. Jenner had settled in London, and kept the practice a secret, he might have made £.10,000 per annum for the first five years, and double that sum afterwards; for notwithstanding the assiduous labour of Dr. Jenner and others to instruct practitioners, important errors are daily committed in it, both at home and in foreign parts. He believes that not less than two millions of persons have been inoculated with vaccine matter in the world, and he has never known one instance of a patient dying in consequence of this mode of inoculation; and he has only *heard* of four cases which were said to have failed, to the explanation of which Dr. Woodville, Mr. Cline, and Mr. Ring can speak. He believes the computation of deaths occasioned by inoculated small-pox, to be one in three hundred, in England; and not less than one in one hundred and fifty, throughout the rest of Europe, Africa, Asia, and America. (No. 35.)

Dr. WOODVILLE, Licentiate of the Royal College of Physicians, and Physician to the Small-pox Hospital, considers Dr. Jenner as the original discoverer of vaccine inoculation. He has introduced it in one of the hospitals under his care, in consequence of the communications of Dr. Jenner. He gives the preference to the vaccine over the small-pox inoculation, because he finds it equally certain in securing the patient from the small-pox, because it is without danger or risk of life, and

not, like the small-pox, contagious. One patient in the hospital was said to have died of the vaccine inoculation, but in his opinion it was not so, as he had previously caught the small-pox in the natural way, to which his death ought to be attributed; the case of failure which Dr. Bradley mentioned, was a child who had been inoculated with the cow-pox, but who died in consequence of a bowel complaint, attended with diarrhoea to so violent a degree that he attributed its death to that disorder, and not to any thing belonging to vaccine inoculation. He has inoculated 7500 patients up to last January with the vaccine disease, about half of which number have been since inoculated with small-pox matter, in none of whom did the small-pox produce any effect. The mortality occasioned by the small-pox will be found in the calculation delivered in; which agrees with Dr. Blane's. (No. 3.)

Sir WALTER FARQUHAR, Bart. Licentiate of the Royal College of Physicians, and Physician to his Royal Highness the Prince of Wales, stated, That he never heard of vaccine inoculation previous to its introduction by Dr. Jenner. Two of his own grand children were inoculated at the same time; one with the small-pox in the usual manner, who had it at first in a favourable manner, but latterly attended with considerable eruptions and convulsion fits; the other child was inoculated with the cow-pox, which he underwent in the mildest manner possible, and on the 12th day from the inoculation was brought home to his brother, and lived with him during the progress of the small-pox, without the smallest symptoms of catching it. He considers vaccine inoculation as the greatest discovery which has been made for many years; thinks Dr. Jenner has suffered in his fortune materially by making this discovery public; that on its first being communicated to him by Mr. Cline, he said, that if Dr. Jenner was confident of its success, and would reside in London, he would insure him £.10,000 per annum; but that if he suffered the secret to be divulged, every practitioner would get hold of it, and Dr. Jenner lose all chance of emolument. This has actually happened, and he has therefore lost the opportunity of making his fortune. He is of opinion that vaccine inoculation is a permanent security against variculous infection, and it never has proved fatal. The general computation of the mortality of the small pox, when performed in the best manner, is about one in three hundred. (No. 36.)

Mr. JOHN RING, Member of the Royal College of Surgeons, considers Dr. Jenner as the author of vaccine inoculation, and the discovery itself as being beyond all comparison the most valuable and important ever made by man; he believes it

to be a perfect and permanent security against the small-pox; he has inoculated upwards of 1,200 persons with vaccine matter, and has reason to believe that at least 1,000 of them have been either voluntarily or involuntarily exposed to variolous infection, which they all resisted. The vaccine inoculation is attended with no danger unless from ignorance or neglect. If Dr. Jenner had kept this discovery to himself, his practice might have been worth £. 10,000 per annum, it being well known that certain individuals have acquired as much or more by the ordinary practice of physic; all humours and disorders which happen after any species of inoculation, are commonly attributed to that inoculation by persons prejudiced against it, and others are sometimes influenced by their opinions; but he knows of no instance where the cow-pox has occasioned any other complaint, than what may be caused by any other disease which is equally mild; he is of opinion that every disease is capable of exciting other diseases or humours, in proportion to its magnitude; the magnitude of the cow-pox depends much upon the treatment. He never practised the small-pox inoculation in any particular manner, nor ever kept any account of the number he inoculated, but supposes it might amount to about 600; he thinks that about one in every hundred in London, on an average, inoculated with small-pox, die; the reason of a greater mortality prevailing amongst persons inoculated for the small-pox in London, is the unwholesomeness of the atmosphere, and the frequent necessity of inoculating children at an improper age; he has never known any accident happen from inoculating from a spurious sort of cow-pox; in respect of the periods of coming out and turning, the inoculation of the cow-pox is subject to the same laws, and liable to the same variations, with the inoculation of the small-pox; it is not more difficult to determine whether a patient has had the regular cow, than whether the patient has had the regular small-pox, provided care is taken not to interrupt the regular progress of the vaccine pustule by friction; he has known local inflammation produced both from inoculation with vaccine, and inoculation with variolous matter, without being followed by any pustule; in this respect, therefore, the two inoculations are similar, and he knows of no advantage either in this or any other respect which the inoculation of the small-pox has over that of the cow-pox. (No. 38.)

Dr. JAMES SIMS, Licentiate of the Royal College of Physicians, and President of the Medical Society of London, stated, That he was originally adverse to vaccine inoculation, but his confidence had been increasing in it every hour, from the repeated trials and authorities cited of its efficacy. He never
heard

heard of it before Dr. Jenner's publication, to whom alone he attributes the discovery, which he looks upon to be the most useful ever made in medicine; he thinks that if Dr. Jenner had kept it a secret, as he might have done, he might, during his life (if protracted to a moderate length) have become the richest man in these kingdoms. The vaccine disease does not introduce any other disorder into the human frame. The computation made of deaths occasioned by the natural small-pox, by Dr. Jurin and others, is one in six.

Dr. Sims laid before the Committee a testimony, unanimously resolved upon by the Medical Society of London, (which consists of above 150 members resident in the metropolis, and of more than double that number residing elsewhere) in favour of this very important discovery, signed by himself as president. (No. 37.)

Mr. JOHN ADDINGTON, Member of the Royal College of Surgeons, is acquainted with vaccine inoculation, and has practised it since the spring of the year 1799 with uniform success, and has kept an exact register of cases to the number of eighty-one, with all their particulars. He has inoculated with variolous matter, and exposed to the infection of natural small-pox in its most violent forms, and in every stage, by every method he could devise, about one-third of his patients, and in no case was the infection of small-pox communicated. He further stated, that he had been particularly careful in the choice of the matter employed in vaccine inoculation, and had not found in his own practice any case of spurious cow-pox, but had seen many cases of spurious small-pox; and therefore considered that the objections which are thought to arise against the vaccine inoculation from this source, apply equally against the inoculation of small-pox. (No. 21.)

Dr. LETTSOM, F. R. S. Licentiate of the Royal College of Physicians, and Physician Extraordinary to the City of London Lying-In Hospital, stated, That he looked upon Dr. Jenner to be the discoverer of vaccine inoculation. He thought that inoculation of the small-pox had increased the number of deaths. About the year 1773, he paid particular attention to this subject, which afforded some observations applicable to the present inquiry, and decisive upon a large scale of calculation, which a table by figures more clearly evinced. The experience of forty-two years preceding the introduction of inoculation into this country, was already placed in a clear point of view in the Philosophical Transactions, by Dr. James Jurin, who was a sanguine advocate for inoculation, and whose testimony was therefore unexceptionable. His numbers were taken
from

from the yearly bills of mortality, and the reason why the fourteen years from 1686 to 1701 were omitted, was, because in the bills of those years the account of the small-pox and measles were not distinguished as in the preceding and following years, but were joined together in one article, so that from them no certain account could be drawn of the number of persons that died of the small-pox. It appeared by these tables, that out of 1,005,279 burials within the last forty-two years, 1,742 persons more have died of the small-pox than the proportionate number, as collected from the experience of the first forty-two years; seventeen more burials therefore in one thousand had been occasioned by the small-pox, since inoculation had been adopted. He believes that the inoculation of the cow-pox secures the person inoculated from the small-pox, as much as the method of inoculation for the small-pox, with this difference, that the cow-pox is not infectious. Vaccine inoculation has diminished the fatality occasioned by the natural small-pox, by lessening the number susceptible of taking it. Taking London and the out parishes as containing nearly 1,000,000 of people, he calculates, that 3,000 probably died yearly by the small-pox, or eight every day; or allowing Great Britain and Ireland to contain 12,000,000 of people, no less than 36,000 annually. About eight persons die by the small-pox every day in the metropolis and its environs, or about fifty-six in each week; although, from some defects in the Bills of Mortality, the amount does not appear to have exceeded forty-five; But if he calculated the last three weeks in March last, which amounted to thirty-five deaths, and compared them with three weeks in March for ten years preceding, which amounted to 697, it would result that the present month was thirty-five less than the average of ten preceding years, that is, from 1790 to 1800. He thought that the genuine cow-pox was never fatal; he had reason to conclude that about 60,000 persons had been inoculated with cow-pox. He had heard cursorily of four deaths; but upon minute inquiry, he was convinced that three of them had no connection with the cow-pox: Of the fourth, he had received no accurate information. But supposing the cow-pox, during its progress, to occupy fourteen days, it appeared by the deaths in London, that on a common average, in every 60,000 healthy subjects, seven died in fourteen days, without the infliction of any disease, but what was in the common course of events; that knowing the fatality of small-pox, and risk occasioned by inoculation, he was early inquisitive upon this important subject, both from its consequence to mankind in general, and from his acquaintance with some particular families, who had suffered both from the natural small-pox and inoculation;

tion; and from those who had adopted the practice, no one unfavourable event has resulted. Hence he acquired the most favourable opinion of the practice, which his subsequent experience has not altered: That he had not known any inconveniences to follow the spurious sort of cow-pox. He further stated, That if Dr. Jenner had kept this practice a secret to himself, he might have derived immense pecuniary profits; and that considering the apparent incredibility of the practice to common observation, and the secrecy with which the Suttonians long monopolized the inoculation of small-pox, that Dr. Jenner might have exclusively kept the practice to himself for a long period. Upon being asked, Whether he had ever known a patient who had been inoculated for the small-pox, undergo that disease a second time? he replied, That he had two relations inoculated under the Suttonian method, both of whom afterwards took the small-pox in a natural way, one of whom died; and less than twelve months ago, he had attended two children in different families, the parents of which assured him that they had been inoculated for the small-pox a year or two before his attendance, when both were attacked severely with the natural small-pox. He added, that the mode of small-pox inoculation practised by the Suttons and Baron Dimsdale, was the same as now adopted; but by some vague pretensions of the former, the public opinion ran very generally in their favour, till Baron Dimsdale published his account of the Suttonian method. (No. 41.)

Mr. CLINE, Member of the Royal College of Surgeons, and Surgeon to St. Thomas's Hospital, stated, That in July, 1798, he received some vaccine matter from Dr. Jenner, with which he inoculated a boy who had not had the small-pox; when he had gone through the stages of vaccine inoculation, he tried to infect him with small-pox by inoculation, but in vain; this circumstance, together with the communications he received from Dr. Jenner, produced the strongest conviction in his mind of the great utility of this practice, and he therefore recommended it strongly to all his friends, amongst whom was Sir Walter Farquhar, and he perfectly recollects the conversation relative to the emolument Dr. Jenner might derive from the practice of vaccine inoculation; but Dr. Jenner at that time declined settling in London. Mr. Cline looks upon it as the greatest discovery ever made in the practice of physic, for the preservation of the human race, as the small-pox had been the most destructive of all diseases.

[To be continued.]

Observations

Observations on the Modus Operandi of Opium:

[Continued from Vol. VII. p. 360.]

WHEN it is considered what an amazing number of experiments have been made with Opium upon different animals, all tending to prove, that, however applied, it directly weakens, and ultimately destroys, all the different faculties and functions of the body; that it is remarkable above all other medicines for *inducing sleep, which is prevented by stimulants*,* and that its characteristic quality is that of *allaying every kind of stimulus*,† it cannot but appear surprizing, that so many clear and positive proofs as are upon record, of its acting directly as a sedative, should have been set aside, and that it should have been pronounced a stimulant, in opposition to the most decisive evidence, on account of its being often found primarily to increase the frequency and fulness, and sometimes the strength of the pulse, and producing a few other effects,‡ which can only be considered as equivocal signs of a stimulant operation, and which, will be found upon investigation, to proceed from the directly sedative effects of the opium upon the different coats and vessels of the stomach and small intestines, independently of its action upon the nerves of these organs.§ And

* Silence and repose, with a freedom from every sensation of *stimulus*, are no less effectual in producing sleep. Sleep is impeded by every kind of *stimulus* of the senses, or of the mind." Young on Opium, p. 24, 25.

† "It seemed to abate the present *stimulus* till the acrimony was corrected. The *stimulus* is abated for a time, by opium; but soon returns with more violence, as long as the acrimony continues. In this case the *stimulus* was so great that opium could not abate it. But when Nature is not able to bear the incessant *stimulus* and evacuation, it may be necessary to have recourse to opium to procure an abatement of the symptoms, and some intervals of ease. Such spasmodic contractions are increased by every effort of Nature to expel the stimulus. It may seem a kind of paradox, that the medicine which, in the opinion of the world, is thought to be chiefly useful as it *abates a stimulus*, should yet be the best promoter of that stimulus which excites labour pains," &c. &c. Young's Treat. p. 33, 47, 48, 49, 57, 61.

‡ Such as, "In twenty minutes perceived a slight warmth, and soon after a degree of moisture on my skin. In half an hour I found myself, or at least imagined myself, more alert and sprightly than before. In twenty minutes my pulse was fuller as well as quicker, the heat of my body was raised, and I perceived a manifest increase of spirits. In this state I sat down to dinner; and it was observed by one who knew nothing of what I had taken, that I looked as if very drunk," &c. &c. Inquiry, p. 35, 66, and 67.

§ It is not here supposed that the nerves of the stomach are exempt from the action of the opium, but that the effects are chiefly owing in this, as well as in every other instance, to its coming in contact, or nearly so, with the arteries, and other vessels, of the part to which it is applied.

upon this idea the phenomena above enumerated, as well as several others, which have hitherto been considered (and as long as Opium is supposed to act as a stimulant will certainly remain) inexplicable, may be accounted for in a consistent and satisfactory manner; such as its allaying the cravings of hunger, producing nausea and vomiting; its sometimes immediately removing such disorders of the stomach and bowels as arise from, or are accompanied with, excessive irritability, as vomiting, diarrhoea, tenesmus, &c. &c.

*If opium acts in the way I have stated, i. e. solely and directly as a sedative, it must immediately diminish the sensibility and irritability of the arteries (those destined for secretion as well as nutrition) veins, absorbents, nerves and lacteals (the vessels and fibres, in short, of every description) of the stomach and upper part of the intestinal canal, and thereby their motions and powers of motion will be lessened or destroyed; * consequently, the muscular coat of the stomach and small intestines will act feebly, or not at all; and thus their peristaltic motion will be more or less impeded; hence vomiting, diarrhoea and tenesmus will be suppressed; the secretion of the gastric juice being also interrupted, and the process of digestion suspended or carried on imperfectly, the sensation of hunger will be allayed; the stomach being by the causes above-mentioned rendered incapable of performing its functions, its contents will advance rapidly towards such fermentations as their nature, whether animal or vegetable, renders them most liable to; hence nausea will take place, and continue, in a greater or less degree, till the stomach, stimulated by the acrid and offensive matter it may contain, acting mechanically, and probably also chemically, upon its tunics, will frequently recover its power (where the dose is not so large as to destroy the sensibility) so far as to enable it to expel the whole or a part of its contents by vomiting. †*

As the arteries of the stomach are both numerous and considerable, and have frequent communications with the arteries
of

* Precisely in the same manner as when it is applied to any other part of the body.

† "In a small dog which Dr. K. Boerhaave opened after having given him three grains of opium, he observed scarce any peristaltic motion in the guts; the stomach was much distended, the pylorus was shut, and the bread and milk, which the dog had taken with the opium about ten hours before, was indigested. There was nothing like chyle in the duodenum, nor any lacteal vessels to be seen in the mesentery. The bladder of urine and great guts were much filled, nor had the animal evacuated either urine or feces from the time he swallowed the opium." *Whytt's Essay*, p. 345.

of all the neighbouring viscera*, they must require a pretty large quantity of blood to fill and circulate through them; and if the regular demand thus made upon the heart be suddenly lessened, (*as it certainly is in a greater or less degree when opium is taken internally*, by its diminishing their sensibility, irritability, and mobility, in consequence of which the regular transmission of blood, through all those branches which are near enough to be influenced by the opium, is interrupted) it will have the effect, for a short time, of increasing the frequency, fulness, and strength of the pulsations of the heart and arteries, and these effects will be more or less considerable, and of longer or shorter duration, according to circumstances; but if my ideas of the *modus operandi* of Opium be well founded, they will *always* occur (when they do take place) *in a very short time after it has been taken*; and this appears both from the experiments and observations of different writers to be actually the case †.

But to be more particular, let us suppose an adult subject, unaccustomed to the use of Opium, to have taken two grains, or two and a half; its *primary effect* I presume will be, to diminish the frequency and force of the pulsations of the smaller series of arteries situated in and near to the villous coat of the stomach, and by degrees (sooner or later in proportion to their vicinity, and to their ability to resist the power of the medicine) it will retard, and at length put a stop to the circulation in the larger arterial branches, not only in the villous but in the muscular and other coats of the stomach, (it will at the same time lessen or intercept the motion of the nervous power in the nervous coat of the stomach, and may also have some influence upon the nerves of the other viscera), and the heart and large arteries, being unable to overcome the resistance, a degree of plethora will take place, *pro tempore*, which will increase the frequency, strength, and fulness of the heart's contractions; an additional quantity of blood being now sent

* "From this detail we learn, that the arteria coronaria ventriculi, pylorica, intestinalis, both gastricae, gastro epiploicae, and consequently the hepatica, splenica, and mesenterica, communicate all together." *Monro's System of Anat.* Vol. 3, p. 130.

† "In Dr. Crumpe's sixth and eighth experiments the pulse was found to be increased in five minutes from 70 to 74, and in his seventeenth from 70 to 78 in the same time; in the nineteenth 15 minutes were required to raise it from 72 to 74; but in this experiment he had taken the gum freed from the resin: and in the seventh experiment, 25 minutes had elapsed before the pulse became more frequent, which will not appear surprizing when we consider that one grain had been taken by a robust healthy young man, the natural standard of whose pulse was no more than 44 pulsations in a minute.

sent to the brain, as well as to the other parts of the body, its energy will be increased, and he will feel himself more or less exhilarated; probably also, the heat and perspiration may be somewhat augmented. But it will be obvious that this state of things cannot continue a long time, seldom longer I imagine than 30 or 40 minutes) because, in general, by this time, the circulation will have ceased *in the veins* of the different coats of the stomach*, and whenever that 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, strength, and fulness of the pulse, from which cause a degree of languor will be perceived: by this time also a part of the Opium will in all probability have been conveyed to the heart, by the lacteals or absorbents of the stomach and intestines; and this concurrence of circumstances will have a powerful effect in diminishing the frequency, strength, and fulness of the heart's contractions, *so as to reduce them considerably below the natural standard*; and the general excitement of the system being in this manner suddenly diminished, the languor will now be more considerable in proportion to the want of vigour in the circulation, and will be accompanied by drowsiness, vertigo, nausea, pain in the head, tremors in the hands, &c.; some, or all, of which symptoms will continue to be more or less troublesome, till the vessels of the stomach and intestines have recovered their sensibility, irritability, and mobility; and in proportion to the rapidity of this process, will the stomach and intestines be restored to the exercise of their natural functions: the pulse will speedily reassume its usual frequency and strength, when the vessels of the stomach again become pervious, so as to allow a free passage to the blood.

But let us, in the next place, suppose a person in similar circumstances, to have taken *a large dose of opium*, e. g. four grains or upwards; this quantity will operate 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 will be 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

* The coats of the veins being less irritable than those of the arteries, and the circulation in them not depending principally, as in the arteries, on muscular action, I imagine that *a moderate dose of opium* will not so speedily stop to the circulation in the former as in the latter.

† The ductus pancreaticus and communis choledochus,

and more especially from the liver by the hepatic veins, to be intercepted and detained in the veins belonging to the different viscera; and one great source by which the heart is usually supplied with blood being in this manner 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 in the minute vessels of the extremities; as we have seen exemplified in the experiments of Dr. Alston.

If the heart sends out a smaller quantity of blood than before, less will be sent to the lungs in a given time, and the quantity sent will not be transmitted with the same facility as before, on account of the inactivity of the pulmonary arteries, which will soon have the effect of retarding the circulation in the pulmonary veins, and thus, one of the most important purposes of respiration, namely, the oxygenation of the blood, will be imperfectly executed, which will add to the debility already prevailing in the system. The passage of the blood from the right ventricle to the left auricle being in this manner obstructed, a degree of uneasiness will be excited in the chest, which will be a little relieved by every inspiration and expiration, (the alternate dilatation and compression of the lungs in respiration making up, in some degree, for the want of power in the heart and pulmonary arteries) he will therefore make deeper inspirations, and endeavour to put the intercostal and other muscles employed in respiration into action more frequently, with a view to remove the oppression; the relief obtained, however, will be only temporary; for the torpor in the part first exposed to action of the opium having been, by this time, communicated in a greater or less degree to the diaphragm, the intercostal and abdominal muscles, the respiration will gradually become slow, difficult, and laborious; and as the tendency to congestion increases, possibly some of the veins may give way so as to allow the blood to escape into the neighbouring cells, still farther impeding respiration, and contributing (with another cause to be mentioned by and by) to render it stertorous as well as laborious.

The circulation in the veins having lost much of that assistance which it commonly receives from the arteries, when their pulsations are strong and vigorous, and the torpor continuing to increase throughout the system, the vena cava will convey less and less blood to the heart, and the circulation will become more and more languid; and now, from the want of energy in the vessels of the brain, arising from the diminished power in the heart
and

and arteries, the blood will loiter and stagnate in the veins and sinuses of the head, and occasion coma, stertorous breathing, subsultus tendinum, &c. Should any of the veins or sinuses give way (which may very probably happen, partly from a loss of tone in the vessels, and partly from their being more distended with blood than usual) convulsions, when they occur at this late period, may arise from this cause; but they in general occur in a much shorter time after the Opium^e has been exhibited than we are at present supposing; and in such cases, *I attribute them to the Opium destroying the mobility of the vascular system, in a greater degree, and more speedily, than the mobility of the nervous power.** °

As an illustration, and at the same time as a proof of the truth of what has been suggested, it may be worth while to compare the state of the appetite and the circulation in a few hours, or in any given time, after a dose of Opium that has been taken internally, with the state of these functions when an equivalent portion has been applied externally.

If

* The following observations appear to me to throw considerable light upon this part of the subject. "That opium causes convulsions is owing, in my opinion, to its destroying at different times, and in an irregular way, the irritability of the muscular fibres. It is besides certain that men and women of a delicate and weak frame are always the most subject to convulsions; and it is not possible to suppose in these people a superabundance of animal spirits. We know that all the muscles, even in a relaxed state, preserve notwithstanding a certain tension of their fibres, which, when they are cut, never fail to contract themselves, and to enlarge the wound. When a muscle becomes paralytic, it lengthens, and its antagonist then contracts the more; which shows that the repose of the muscles depends on the equilibrium of strength betwixt the different muscles, and betwixt their different fibres. The powers thus balanced, destroy and renew themselves at every instant, without producing any motion or sensible change. This natural tension of the muscular fibres certainly depends on an equal and exact distribution of the fluids in the whole substance of the muscles. This truth is demonstrated in a Dissertation which I published in the third vol. of the *Acts of Sienna*, which was in part reprinted some time after at Lucca, with several considerable additions, and which was afterwards inserted in the first vol. of my *Animal Physics*. But if these muscles do not receive the same proportion of fluids, or if these fluids reach them, or are distributed amongst them, with an unequal quickness and energy, the equilibrium of the mutual effort of the muscles is immediately destroyed; the strongest of them contract; and hence arise the convulsions and violent agitations of the whole frame. This is the reason why those who die of an hæmorrhage, as well as those who perish by poison, are seized with convulsions; for it certainly is not probable that the loss of blood and of strength should bear an equal proportion in every part, in every muscle, and in every fibre, whilst the circulation itself is unequal, and the muscular irritability is destroyed gradually, and in a very irregular way, according to time and circumstance." Fontana's *Treatise on Poisons*, Vol. I. p. 81. 82.

If Opium produces any one effect more regularly than another in the former mode of exhibiting it, namely, by the mouth, it is that of *impairing* the appetite and digestion; and it often, as we have seen, *increases* the frequency of the pulse. But in the latter mode of applying it, the effects are exactly reversed, that is, the appetite and digestion are *never* impaired, *but often improved and strengthened, and the frequency of the pulse is diminished.*

The causes are obvious and easily explained, if we only keep in mind that in the mode of exhibiting it first supposed, it comes into contact with the internal surface of the stomach and intestines, but must pass through a circuitous course before it arrives at the heart and arteries; and that in the other mode of introducing it, namely, by the lymphatics, it has immediate access, or nearly so, to the heart and arteries, but has no immediate communication with the alimentary canal.*

Thus

* The manner in which I suppose it to operate when it improves and strengthens the appetite and digestion, is by diminishing the sensibility, irritability, and mobility of the heart and arteries, and thereby disposing them to receive and retain a larger quantity of chyle, than the irritable and contracted state they were in before would admit of.

By viewing the subject in this light, I am led to believe that the opiate frictions may be of service in the treatment of phthisis pulmonalis, as soon as the hectic fever is fully formed, when the taking of nutriment has in general the effect of creating a good deal of disturbance in the sanguineous system of vessels, by which the debility is increased in the system at large, and a greater determination of blood to the lungs than usual takes place, increasing inflammation in the thoracic viscera where it is present, or furnishing a predisposition to it where it does not already exist.

The proper times for their application would be, I should conceive, immediately after every meal, *or at least after the principal meals*; but a good deal would depend upon the degree of excitement which the food might occasion.

Should the disturbance be prevented, *and the frequency of the pulse reduced by these means*, the patient might then, with great probability of advantage, use such moderate exercise as might appear to be best adapted to the degree of bodily strength he possesses; as riding in a carriage, on horseback, or walking.

The *internal* use of opium I should suppose to be highly improper *in every stage of the disease*, on account of its tendency to impair and destroy the functions of the stomach and intestines, (by diminishing their action and secretions) and thus often increasing the mobility of the vascular system, as well as the sweating, in each of these ways increasing the debility; and this idea should be constantly kept in view with regard both to diet and medicine.

It may not be altogether foreign to the subject to mention an opinion I have long entertained, that opiate frictions may probably be of use in some circumstances of the treatment of most if not all those diseases which form the third Order of the second Class of Cullen's Nosology, and have several times, particularly in my first paper, published nearly three years ago, ex-
pressed

Thus it appears, that upon the principles laid down above, the various and insuperable difficulties which occur in every other

pressed a firm conviction of their probable utility in hydrophobia and tetanus. They have been tried with advantage in the latter, and it now appears that a good deal of benefit has been derived from their use in pertussis and cholera, (see the last Number of the Medical Journal, p. 305,) all which diseases belong to the class and order abovementioned; but there is another most formidable and in general fatal disease, belonging to the same order and class, in which I think they promise, *with the assistance of opium internally*, to be extremely beneficial. The disease to which I allude is diabetes.

It is with great diffidence that I venture to submit the following opinions to the serious and candid consideration of the readers of the Medical and Physical Journal.

I shall not hazard an opinion as to what may in general be the remote cause of this disease; I suspect, however, that it sometimes arises from exposure to cold, accompanied by violent or unusual exercise.

The proximate cause I suppose to consist in an increased action of all the vessels and coats of the stomach, *occasioning an increased secretion of the gastric juice*. I conceive also, that the unusual quantity of gastric liquor secreted, stimulates the internal surface of the lacteals and absorbents of the stomach and intestines, as well as that of the arteries, veins, and emulgent vessels, and thereby increases their mobility, and produces the immoderate discharge of urine, and also the great thirst and voracious appetite; and this I imagine to be the state of the natural and vital functions in diabetes insipidus.

In diabetes mellitus, I imagine there is not only an *increased secretion* of gastric liquor, but that there is also an alteration in its properties.

If the above representation be founded in truth, (which I believe it to be) it seems to me to suggest a different mode of treatment to any that has hitherto been recommended. The indications will be simple and clear, viz. to evacuate the gastric juice already secreted in the stomach; secondly, to diminish the action of the vessels and coats of the stomach, and thereby the secretion of the gastric liquor; and, thirdly, to obviate or remove the symptoms.

The difficulty will consist in devising the most proper means by which the indications may be best fulfilled. I shall deliver my sentiments in a few words; and I expect that the opinion I have formed of the *Modus Operandi* of Opium, will be of some practical utility on the present occasion.

With a view to the first indication, the treatment should commence with moderate vomiting, and for this purpose tartarized antimony seems preferable to ipecacuanha, because it produces a greater degree of nausea as well as diaphoresis; and the most proper time for administering it seems to be, when the sensation of hunger or thirst is most keen, as there would then be a fair prospect of evacuating a portion of the gastric liquor.

In order to diminish the secretion of gastric juice, which forms the second and *principal* indication, the sensibility, irritability, and mobility of the vessels and coats of the stomach must be diminished; and I know of no medicine so powerful as opium, *internally administered*, in producing these effects; but then it should be given in such doses as will *not* so *speedily* diminish their mobility, as to *increase* the frequency of the pulse; as from three-quarters of a grain to a grain and a quarter, or from fifteen to twenty-five drops of tincture of opium, three, four, or five times in the twenty-four hours; the best

other theory of the *modus operandi* of opium, and particularly in the *stimulant theory*, entirely vanish, and all the phenomena may be explained in a simple, consistent, and satisfactory manner; without the necessity also of resorting to the improbable supposition of the existence and operation of a *vis medicatrix naturæ*.

But in endeavouring to explain the *modus operandi*, I would not be understood to assert that each symptom occurs precisely in the order and degree I have stated. We know, for instance, that nausea and constipation are not *always* the consequence of

best time to administer the medicine appears to be when hunger or thirst is most prevalent, and at bed-time.

Its sedative effects however should be guarded against, and costiveness obviated by *oleum ricini* internally, or by laxative clysters. Its effects upon the circulation should be ascertained by attentively examining the pulse; as this will be the best criterion by which to regulate the dose, and the frequency of its repetition. If the frequency of the pulse is not materially increased primarily, *nor much diminished ultimately*, the dose might be either somewhat augmented, or repeated rather oftener, when the hunger or thirst is pressing, or the discharge of urine not lessened.

Would its efficacy be increased by joining with it small doses of tartarized antimony; or of ipecac. as in the *pulv. ipec. comp.* or would nitre and tartarized antimony be preferable in some cases?

The symptoms which are generally most troublesome, are hunger, thirst, and the frequent and copious discharge of urine.

The two former have already been in part attended to, in speaking of the most proper means to be used for answering the second indication; and as opium diminishes all the secretions except that of sweat, it seems admirably adapted to every circumstance and symptom of the disease.

Whether the internal or external application acts most powerfully in diminishing the secretion of urine, remains to be tried; but where the disease is accompanied by spasmodic affections, and these are not relieved by the internal use of opium, or where hectic fever is present, I should be strongly inclined to recommend the *external* application, as in phthisis.

In conformity with the above idea of the proximate cause, an attention to diet will form a very essential part of the treatment.

It should chiefly consist of such kinds of animal food as are most difficult of digestion; young meats of every description should therefore be avoided, and boiled beef, mutton, pork, tripe, &c. be preferred.

The drink ought principally, I think, to consist of milk both at meals and other times; because it is not always easily digested and is frequently coagulated by the gastric juice, which may blunt and diminish its stimulating qualities; but occasionally, a moderate quantity of brandy and water, or strong green tea, might perhaps be allowed.

The above plan of treatment, judiciously varied according to circumstances and emergencies, seems to me to promise much; should it fail, we must still I think rely principally, if we expect to succeed in curing the disease, upon that class of medicines ranked as *narcotic sedatives* by Dr. Cullen, with the exception of tobacco, wine, and alcohol; and there can be no impropriety or danger in making a cautious trial of such medicines of this class, as may appear, from their known properties, to be best adapted to the indications.

taking opium internally; and that when they do occur, they sometimes take place at an earlier, sometimes at a later period; and the same remark will apply to some of the other symptoms, such as convulsions, coma, laborious respiration, &c.

Manchester, April 8, 1802.

M. WARD.

[To be continued.]

Case of the Cure of Pertussis communicated by Mr. H. DAVIES, of Piccadilly.

THE Hooping Cough, of late, has been very prevalent both in the metropolis and adjacent parts. In many instances it has proved fatal, in all distressing; every improvement therefore in the plan of treating this disease, by shortening the period and alleviating its symptoms, must prove a valuable acquisition to the healing art, afford a source of satisfaction to the practitioner, as well as comfort and happiness to the patient,

I was pleased on observing in your last Journal, an account of the beneficial effects attending the external use of Opium in this disease, and shall be happy if, upon future trials, its utility be confirmed and established.

I beg leave to mention an instance in my own practice, where an exhibition of the aqueous solution of Asafœtida, joined with the decoct. cinchon, proved highly beneficial in this disease. A few weeks since, my attendance was requested in a family in Oxford-street, where five of the children were attacked with the hooping cough; the youngest of whom was but *five weeks* old, the ages of the rest were from three to nine. I began the treatment by administering an antimonial emetic, which was repeated every third or fourth day; and on the intermediate days, ordered the solution with an equal part of the decoction of yellow bark to be given three times a day, in doses suited to their respective ages. But, being apprehensive that the medicine was somewhat too noxious to be retained on the stomach of the infant, on account of its tender age, I substituted small doses of the extr. cicutæ in a pleasant mixture, with the addition of a few drops of the vin. antim. tartar. and blisters applied to the sternum, with considerable advantage; inasmuch, that the paroxysms, which threatened immediate suffocation, were in the course of a few days surprisingly abated, and in two or three weeks the infant entirely recovered.

The other children persisted regularly in the use of the solution and bark; which produced the happiest effects in diminishing

ing the spasmodic tendency of the disease, and in about the same space of time they became convalescents; experiencing only a slight trivial cough now and then, which perhaps might be deemed (according to Dr. Cullen) merely the effect of habit in the constitution, as a consequence of the former malady.

I have been long prepossessed in favor of the antispasmodic effects of asafœtida in this disorder; but, from its noxious taste, and the fixed aversion in children to medicines in general, especially those of the disagreeable kind, I never had an opportunity of seeing it fairly and regularly administered, except in the instance now mentioned; and I am very happy in not finding my expectations disappointed. Should a future trial of this medicine, in the hands of judicious practitioners, be attended with equal success, it will afford further gratification; as I know no class of patients that lays a juster claim to our tenderest regard and minutest attention than the infantile race, whose diseases are as numerous as they are oppressive to their delicate systems.

Piccadilly, April 9, 1802.

*Observations on the Acetite of Lead; communicated by
Mr. MICHAEL RYAN, of Kilkenny.*

ALTHOUGH physicians are in the daily practice of prescribing medicines of the most deleterious powers with impunity, it is singular enough to find one belonging to this class, of very inferior agency, rejected as inadmissible by the writers on the *Materia Medica*. Thus arsenic, belladonna, digitalis, and many others, are not only taken in modified doses with safety, but with singular advantage; while the acetite of lead, in the smallest quantity, is universally dreaded, from the pernicious influence it is supposed to exert on the living muscular fibre. Here, a question very naturally presents itself. Is this generally received opinion of its destructive power, the result of experiment and accurate observation? From what I have had an opportunity of witnessing, I do not think it is.

A physician, whose writings have eminently contributed to embellish as well as to improve the science of medicine, has, by his different Essays on this subject, given currency to the idea of lead, in any shape, being too hostile to the human constitution to admit of its being employed as a remedy in the cure of diseases. The intelligent reader will readily anticipate the learned writer I allude to.

Sir

Sir George Baker has taken great pains, and with some appearance of truth, to prove in many instances the existence of colic from the specific operation of lead. The varieties of this disease, as Colica Pictonum, Derbyshire Colic, Morbus Colicus Damnoniorum, &c. are all by him ascribed to the action of this metal in one shape or other. That such is the fact on some occasions it is not intended here to deny; but whoever reads with attention, and forms an impartial judgment of the numberless cases of colic, which are said to derive their origin from this source, before he gives his unqualified assent to them, must first consider this poison more virulent and unmanageable than any other in the vegetable or mineral kingdom, even arsenic itself not excepted. The very small portion of it, which is said to be followed with such untoward consequences, is above all belief, and will find very little credit in this age of daring experiment and enterprise. Even Sir G. Baker himself, by what follows, does not attempt to say that the evidence in favor of this opinion is demonstrative, though he does not seem to question its high degree of probability. Speaking of the grounds on which this belief rests, he says, "This opinion must still await the judgment of future observation and inquiry. On the one hand, from the nature of the subject, it is not reducible to the certainty of demonstration; on the other hand, it does not appear that its probability has hitherto been lessened either by reasoning or experiment." Vide London Med. Trans. vol. iii. p. 408. In this state of uncertainty the only method of adjusting the point in question (and surely it is an object of the first moment) is by administering certain preparations of lead in the same guarded and cautious manner as is practised with respect to other medicines of singularly active powers. What has immediately in this way come within the sphere of my observation, I shall relate with candour, and leave the reader to judge how far the practice may be imitated with safety or advantage.

About six years ago a very obstinate case of spitting of blood being committed to my care, every remedy usually resorted to on such occasions was made use of to endeavour to stop the discharge, but to no purpose. Happening to recollect some observations made by Dr. Reynolds in the third volume of the L. Medical Transactions with respect to the use of acetite of lead in hæmoptysis, I determined to adopt this practice in the present instance; but as the danger was very imminent, the medicine was given in the dose of two grains every third hour instead of one grain every sixth hour, as prescribed by Dr. Reynolds. Before the fourth dose was administered, the bleeding from the lungs began to cease, and very shortly after totally disappeared. The medicine was continued for several days without

without the patient experiencing any pain in the bowels, or any other disagreeable consequence whatsoever.

Encouraged by the fortunate event of this case, I never let slip an opportunity of giving the acetite of lead in every dangerous instance of hæmoptylis that came under my direction. In fact, two patients of mine have been taking it for upwards of a week, very lately, in the dose of six grains every sixth hour; and though they were minutely questioned as to its effects on the bowels, they never complained of pain, griping, or any other unpleasant sensation; nay, contrary to the generally received opinion, no costiveness or constipation was induced that could not be immediately removed by a moderate dose of castor oil or any other mild aperient medicine.

On looking over my Book of Reports, I find, besides the two just now mentioned, a detail of six cases, in which not less than twenty or thirty grains of acetite of lead were given daily for eight or ten days successively with perfect safety, and no precaution was taken to obviate its poisonous quality, except by adding three or four drops of tinct. opii to each bolus or draught, which ever happened to be prescribed. If these be facts, whose authenticity cannot be called in question, (and I do not think I could be deceived) one medicine more will be restored to the *Materia Medica*, which promises incalculable advantage to the healing art, from which the timidity of physicians had completely banished it.*

A Sketch of the Weather at Londonderry, in the Year 1801; communicated by Dr. PATTERSON, of that Place.

THE commencement of *January* was boisterous, but the weather soon grew mild and genial; which temperature, with little exception, it preserved throughout the month; and some of the nights, particularly at the beginning, were softer and warmer than the preceding days. There were, indeed, several fresh and cool breezes, together with some sharp, but short, congelation, and three or four days of foggy air. The prevalent winds were W. and S. W. The maximum of Fahrenheit's thermometer was $46\frac{1}{2}^{\circ}$; its minimum, 30° . In *February* the winds were generally moderate; the heat of the air was mostly temperate, sometimes tepid; and this state of the
air

* The Editors inform Mr. R. that since the appearance of Dr. Reynolds's paper, the acetite of lead has been used very freely in London.

air often prevailed in the night as well as in the day. The blowing and wet weather that did occur, took place more during the nights than the days. In these two months, the warm winds were to the cold in the ratio of 55 to 28. In this month, thermometer, max. 52° ; min. 35° . *March* produced frequent fresh breezes, and chiefly from the warmer points; often showers also, and some heavy rain; both wind and rain were greater in the course of the nights than of the days; and the temperature of the air, which was cold till the 24th, then changed to so warm a state, that persons accustomed to wear great coats laid them aside; no wonder, when the thermometer rose to 61° in the shade; its minimum was 36° . Prevalent winds W. and S. W. Though there was a good deal of hail and some snow in *April*, yet the ground was so warm that they soon vanished; and the general temperature of the month was remarkably pleasant and genial; and in the latter part of the month, there being good moonlight, the nights as well as the days were quite delightful. Prevalent winds were S. and W. Thermometer, max. 71 ; min. 33° . The beginning of *May* was equally dry with *April*; and between the two months there were twenty-four days, during which hardly any rain fell. The force of the winds was partly strong, partly moderate; and their direction generally came from the colder quarters, which made this month less genial than the preceding. Thermometer, max. $67\frac{1}{2}^{\circ}$; min. 49° . The winds in *June* were generally moderate in force, but proceeded from cold points, principally N.; though the sky was often covered with clouds, and indicated both rain and thunder, yet none of the latter, and comparatively little of the former, happened; whilst a considerable degree of exsiccation took place in the air. Thermometer, max. 72° ; min. 53° . In *July* the winds were more frequently moderate than otherwise; a good deal of rain fell, and both wind and rain were greater in the nights than in the days. The sky was often extensively covered with common clouds, and several times it was streaked with plumous ones, whilst the air was frequently sultry, although the atmosphere was so charged with cloudy vapours. Prevalent winds were W. and S. W. Thermometer, max. $71\frac{1}{2}^{\circ}$; min. 53° . The winds in *August* were generally moderate, often easy, and but few fresh breezes occurred. The air was sometimes foggy, at other times a haze appeared high in the atmosphere; again the sky was covered and lowering, yet frequently the sun shone bright. The temperature of the air for the most part was warm; in turns it was sultry; and taking the month in general, the weather was remarkably fine. In the evening and night of the 12th and 13th days of this month, a considerable quantity of vivid, but
silent,

silent, lightning filled the atmosphere. The predominant direction of the winds was divided between S. W. and N. E. Thermometer, max. 76° ; min. 57° .

Some blowing weather occurred in *September*, but in general the wind was moderate; the sky was now and then overcast, yet commonly clear. For the most part the air was warm; and, two or three days, it possessed a degree of heat which, to the sensations, seemed as if it issued out of the mouth of a hot oven; at this time the thermometer rose in the shade, two o'clock, p. m. no higher than 67° ; its max. throughout the month was $69\frac{1}{2}^{\circ}$; min. 52° . In *October* there was frequent blowing weather; sometimes the gales were considerable, with heavy showers, and both wind and rain were greatest in the nights, very early in the mornings, and late in the evenings. Some days, the air had a pleasant warmth, which twice or thrice extended to the beginning of night. The W. and S. W. winds were predominant. Thermometer, max. 57° ; min. 40° . Squally gales, sometimes stormy ones, proceeding chiefly from N. W. occurred in *November*; a considerable quantity of hail fell, and some snow, which together whitened both the low grounds and mountains; yet, in the middle of the month, the temperature of the air was comparatively mild, and the beginning of some nights was warmer than the preceding days. The first congelation, in the decline of this year, happened the 2d of this month, and the first snow on the 4th. The prevailing winds were W. and N. W. Thermometer, max. 53° ; min. 33° . Frost occurred often, and the degree of congelation sometimes was considerable in *December*, but it suffered frequent interruptions. Snow also fell several times, but upon the whole it did not accumulate more than four or five inches in depth from the surface of the ground, and, like the frost, its continuance was broken by intervals of rain. The winds, which were partly boisterous, partly moderate, were, with the rains, greatest during the nights. The cold winds were to the warm, as 27 to 15. Thermometer, max. 42° ; min. 22° .

Observations on Asphyxia Azotica; communicated to Dr. BRADLEY by Dr. PATTERSON of Londonderry.

THE 19th December, 1801, a little after eleven o'clock, a. m. I was called in a great hurry to see William M'Gertry and his wife, inhabitants of Derry; and was informed on the way, that the wife had been found dead about half an hour before

fore on the floor of her bed-room, and the husband nearly dead, leaning on the bed-side. The woman certainly had been dead several hours, as the whole body was icy cold; no vestige of pulse nor any respiration remained, and every feature of the countenance testified a complete extinction of vitality. She was about thirty years of age, and five months advanced in her second pregnancy.

The man, aged about thirty-three years, breathed obscurely whilst supported in a chair; his pulse was not to be distinguished; his countenance was pallid; his skin cold; and he was unable to articulate a word. Some warm wine was given, succeeded by ammonia; hot dry applications were made to the extremities; and fomentations were used to the abdomen. When he could speak, he complained of great pain about the epigastric region, which seemed to be contracted, and the umbilical region tumefied. After taking some warm tea, he vomited; and as he began to revive, he began to groan, and the pulse became more perceptible. Warm broth and milk, which he took in turns, were the most grateful articles of nutriment.

At twelve o'clock, p. m. he slumbered a little; his pulse was still feeble and rather obscure, with a coldness in the skin. At nine o'clock, p. m. his pulse was quite distinct, his breathing fuller, and his skin warmer. He moaned a good deal, and complained of stomach sickness, nausea, and pain. He had a degree of thirst, to gratify which he prefers cold water mixed with milk.

Next day, his pulse was from 100 to 104 in a minute, but equal; his skin was warm; and he slumbered often during the preceding night. He vomited once in the night; complained yet of pain in the stomach; had little or no appetite; was thirsty, but his head was free of any disorder. For nutriment he preferred milk gruel, which agreed with his stomach; and he took a dislike to broth. He has had no evacuation from the intestines, but he makes urine regularly. I ordered 5 gutt. tinct. opii. in aq. menth. every third hour, and to continue tranquil in bed. These rules he observed three days, when he was able to sit out of bed; and on the 25th, he could take food pretty well, but was not totally free from the pain about the region of the stomach. This pain, however, gradually subsided; and, in less than a fortnight, he was qualified to resume his occupation, which is that of a cloth-buyer for linen-draperies.

The poor woman's fate is the more to be deplored, as she fell a victim to an act of conjugal affection in carrying a chaffing dish of peat coals to warm the bed-chamber for her husband,

who

who had returned from market, after riding above thirty miles in cold frosty weather. The bed-chamber is a small room, about six feet by eight, without a fire place, and with a close door and one window. Shortly after the coals were placed in the room the man went in, and he soon was followed by the woman, who was not long there until she called the servant girl to bring her husband a drink of water; and having taken the vessel with the water from the servant, she locked the room door. No sooner was she undressed than she fainted; and her husband, who had just laid down, sprung out of bed to her assistance, and he also fainted; consequent to which, he had no farther recollection of what happened. Not long afterward, groans were heard by lodgers in an adjoining room, and by the servant; but these groans being mistaken for those of a sick person in another part of the house, the place whence they really issued was not examined, and the unfortunate woman consequently was suffered to meet her mortal doom, whilst the wretched man was just snatched from the jaws of death, to witness and bewail the sad destiny of his affectionate wife.

This recital seems to furnish exercise for pathological ingenuity, to develop the reason why the female, who was but little younger than the male, and of an equally healthy good constitution, should so quickly come to a tragical end, whilst he retained the principles of life several hours after her's were totally abolished by the same poisonous gas, which probably was carbonated hydrogen. Is the cause to be sought for in the de-oxygenation of her blood, by the placental functions abstracting oxygen for the fœtus in utero? Or, is the cause to be derived from the excitability of the female brainular and nervous system, whether she be in a pregnant or non-pregnant state, being easier exhausted by sudden impressions than those of the male? Was being previously so much in the frosty air, and the drink of cold water, any preservatives to the man?

Derry, Feb. 15, 1802.

W. PATTERSON.

To Dr. BRADLEY.

SIR,

HAVING no wish to enter into the Controversy between Dr. Langslow and Mr. Crowfoot on the Cause and Treatment of Apoplexy, I only beg leave to state the following case which occurred to me a few months ago. Mr. S. B. aged 30, of a remarkably full habit of body, short neck, inactive, and much in-

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disposed

disposed to any kind of exercise, was suddenly seized on the 30th of September last, immediately after dinner, with a most violent head-ach, which soon deprived him of all sense and motion. He would have fallen to the ground, had he not been supported by two ladies who were very fortunately with him at the time. On my arrival, (which was in a very few minutes) I found his extremities cold, countenance florid, respiration difficult and intermitting, pulse hard and full; and every symptom indicated what *I considered* Apoplexy. I immediately took ten ounces of blood from the arm, at the same time had his feet immersed in warm water which was well saturated with common salt. I waited for full half an hour; but he did not appear in the least benefited by bleeding, all his symptoms still continued unabated. With some difficulty I got down an emetic, composed of fifteen grains of white vitriol, one ounce of ipecacuanha wine, and twenty drops of the tincture of fox-glove, which in the course of twelve minutes operated; the patient during the operation was supported in an erect posture. After the first or second effort of vomiting he was relieved, became more sensible, and exclaimed, O my head, my head! He gradually recovered during the operation of the emetic; and in the course of two or three hours was perfectly restored, excepting a dull head-ach, which was likewise removed by a brisk cathartic that evening. I found him perfectly well the next morning; and he hath continued so ever since. This gentleman now lives more abstemiously, takes more exercise, and avoids much fermented liquors. I do not presume to make any comments on the above case, I state it simply as it occurred, and what the result was; but I may be permitted to say, that *I believe* the emetic saved his life, and Dr. Langslow and others may consider it as a dangerous practice if they please.

Permit me to return thanks to the authors of the many candid observations on Apoplexy, particularly to the ingenious and learned Pyrrho, likewise to Philo-Medicus for his valuable hints and interrogatories. Should the above case be considered worth inserting in your very useful Journal, by giving it a place in your next Number, you will much oblige,

Shrewsbury,
May 9, 1802.

Your's, &c.

W. CLEMENT, Apothecary.

To the Editors of the Medical and Physical Journal.

GENTLEMEN,

IN looking over Dr. Langslow's Remarks upon my Communication, on Apoplexy, in the last Number of the Medical and Physical Journal, my first intention was to have passed them over in silence and unnoticed, as they did not seem to me, in any degree, to meet my reasoning and observations upon that subject. I have, however, been induced to forego this intention, judging it more candid and respectful to Dr. L. to offer a few remarks on the accuracy and propriety of his Statement; and in doing this, the cause of utility may be served, as perhaps some light may be thrown upon the question under consideration, by the accession of some farther observations pertaining to the nature and treatment of Apoplexy in general. On this occasion, I say, I might have remained silent, because it does not appear, that Dr. L. has, in any of his animadversions, attempted to ascertain the state of the brain, in the act of vomiting; neither has he attempted to prove, that the volume of the blood will, in any state of the body, more than fill the cavity of the veins, by shewing the existence of plethora ad vasa, or the rupture of vessels from the volume of blood surpassing in dimension the cavities of the vessels. He is also silent upon the loss of vitality, and consequent torpor and irritability of the brain as favouring Apoplexy, a necessary effect of the changes of the body as age advances. Neither has any thing been said against the observation, that it is probable, for the most part, the effusion of serum or blood, observable in dissecting Apoplectics, may be an effect instead of a cause, from the well-known fact of the peculiarity of such bodies to evasation of the fluids after death. My reasonings upon these subjects have not been touched upon by Dr. L. and I may, therefore, for the present, consider not only them, as a kind of *sarta testis*, but perhaps some other parts of my reasoning upon which he has animadverted; such as my conjecture, that the cause of Apoplexy may at times be seated in the lungs, and my doubts about the existence of absorbents in the brain.

How far Dr. L. is correct in complaining that I have written under an assumed name, may, I think, with great reason be doubted; in my arguments and observations, I trust, I have preserved the usual, the necessary, courtesy and delicacy due from one inquirer, one friend of science, to another; and having permitted no injury of character to be offered, no personal invective to escape me, I think this complaint wholly without foundation. On the contrary, Dr. L. needs not be told, that in

morals, in politics, in all scientific pursuits and literary inquiries, it would be desirable and useful, that opinions should be weighed and estimated apart, and without regard to persons, or the names or characters of their authors; by such proceeding their value and merit would be really and impartially ascertained, and would be uninfluenced by the passions of party; neither would they be aggrandized on the one hand by the warmth of friendship, nor depressed on the other by the virulence of enmity: I shall therefore preserve my assumed name, although it is a matter of real indifference to me, if I am known to Dr. L. by my real name.*

And his charge of affectation, in referring to authors, will be found equally unfounded and unjust; for as in writing, it is but common justice to refer opinions to their proper authors, so quotation will be ever necessary, in giving the history of opinions. But it would seem, either that all authors that have not fallen within the limits of Dr. L's reading, or that exist not within the pale of his library, are to be considered as ancient; or that he has given a latitude to the interpretation of the term ancient, not usually adopted. According to his interpretation we shall have antiquated Seers of yesterday and Ancients of to-day; for by an unaccountable mistake, Dr. L. has enumerated among his ancients, Caldani and Lupi, who, if they have escaped the ravages of warfare, are Professors still living in Italy. This weakness of quotation, and of ancients according to Dr. L. I am fearful I must still persist in; and perhaps in the sequel it will be found, that it would have been useful to him, had he indulged a little in the same weakness.

For a justification of what I have said of the facility with which Dr. L. has spoken of removing Apoplexy, I need only recall his attention to his own writings, in which he has attempted to shew, that in the afternoon he has effected the removal of that fluid from the brain, which had been effused in the morning, and by its pressure had induced a fit of Apoplexy. This facility seems at variance with all experience on this subject, which tells us, that the fatality of affections of the brain arises in a great measure from the difficulty of absorption in that organ. Hence the effects of external injuries, of tumors in the brain, of the effusion in hydrocephalus, are so difficultly resisted.

There are some other parts of Dr. L's remarks, which I shall now proceed to examine more particularly, as they are brought forward in a high tone of confidence, and with the semblance of answers to my objections and reasoning.

I shall not dwell long upon the supposed importance of the distinction of Apoplexy into sanguineous and serous, Dr. L. having

* The Editors assure Dr. L. that Pyrrho is not Dr. Girdlestone.

having, by his remarks and explanation, given up that distinction altogether; for by having admitted, that it is only necessary in Apoplexy, to adjust the degree of our curative means to the age, the strength, and sex of the patient, he has admitted there is in Apoplexy nothing but what is common to every other disease, and therefore the peculiar and specific distinction, which he deemed heretofore so important, is done away.

On the subject of absorption in the brain, if my judgment deceives me not, it will appear, that by the expression "inhaling viscus," Dr. L. has either made a great discovery in anatomy, or has made use of terms without meaning. As far as my researches have gone in Anatomy and Physiology, I have always understood, that the office of absorption must be performed, either by the red veins or the lymphatics; and in later times, it has been shewn by accurate and repeated experiments, that the business of absorption is the exclusive privilege of the lymphatics; and has been therefore transferred from the veins to them. This being the case, and no lymphatics having been proved to exist in the brain, I would ask, what are the organs or instruments composing the inhaling viscus? and, how are they called?

I shall now proceed to my conjecture, that the cause of Apoplexy, may at times be found in the lungs; "a more wild and fanciful hypothesis than has ever been seriously promulgated." In tenderness to Dr. L. I am almost willing to hope, that he does not wish any meaning to be affixed to these words, but rather, that they should compose an expletive sentence, or be a rhetorical figure, or a kind of *bruta fulmina*; for if this be not the case, I must think a singular fatality attends his efforts in this inquiry; as, unfortunately, among his ancients, I find the cause of Apoplexy has been, at times, already referred to the lungs, and by writers, the authority of whom he must readily admit; and I hope he will not accuse me of affectation, when I refer him on this subject to Sauvage, and to Prof. Walter* of Berlin, in his Commentary on Apoplexy. Hence it appears, this conjecture, so wild and barbarous in Dr. L's opinion, has been long domiciliated and enrolled in the Temple and Tables of Æsculapius. On this subject any farther remarks would be idle and petulant.

In my former communication, I attempted to shew, that the loss of vitality, which the brain sustains in common with other parts of the body in the progress of life, is the most general cause of Apoplexy. This loss pervades the venous system

* Vide J. G. Walter, de Apoplexia.

system of the brain, and may render it less equal to the purposes of circulation; and if we reflect, we shall find in the structure of the sinusses of the dura mater, and in some other peculiarities attending the circulating system of the brain, sufficient reasons to explain, why, as life advances, an interruption of the circulation should take place there, rather than in any other part. Upon inquiry, it will be found, that from the structure of these sinusses, their power as hollow muscles must at all times be feeble, in propelling the blood and promoting the circulation.

And in addition to this structure of the sinusses, it may be observed, there are other peculiarities proving that the irritability of the venous system of the brain is exerted and expended in a greater ratio than in any other part. From the circumstance of the veins having no valves; from the motion of the blood in them being unassisted by the neighbourhood of any voluntary muscles; or by the pulsation of arteries running parallel with them; and also by the perpetual distension of the brain, in the act of expiration.

And if, moreover, it be admitted, that a greater quantity of blood is thrown upon the brain than upon any other equal part, and that from its proximity to the heart, such blood being loaded and charged with oxygen, exerts a more stimulant power upon its vessels than if it were placed at a greater distance, a farther reason will occur why the irritability or vitality of the vessels of that organ should be diminished in a greater ratio than in any other part. Thus both the quantity and quality of the blood as stimulant, conjoined with the forementioned peculiarities of structure, in the progress of life, induce in irritability of the brain and its vessels, which, when partially shewn and expressed, gives rise either to habitual or chronic vertigo, or to palsy, and when more generally, to apoplexy. And upon the same reasoning, it will appear, why the effusion of serum and of blood (but as an effect) should so frequently be found, in the dissection of apoplectics. For from the diminished contractile power or irritability of the vessels, their fibres will be elongated in every dimension, their pores become enlarged, and their strength and density diminished as living solids, and hence, at first congestion, and ultimately evasation of the circulating fluid will take place.

From this reasoning, it would also seem, that Apoplexy, in most cases, is the natural termination of life, or a common and necessary expression of age, in the same manner as takes place in the mortification of the toes of old people.

And in this view of Apoplexy, as arising from the defective vitality of the vessels of the brain, it will appear, that the occurrence

occurrence of this disease may be antedated, and take place, sooner than would be, from the necessary and inevitable changes of the body. This earlier occurrence may happen from any cause unduly affecting the circulation, or diminishing the stimulant power of the blood. Thus, in advanced life, much fatigue of body or mind, or errors in diet, by diminishing the moving powers, may induce Apoplexy. And it may also be observed, that an attack of this disease may be favoured, either by the lungs becoming less ready conductors of oxygen, by change in their texture, or by the air we breathe not supplying the wanted portion of oxygen, either from change of season, of temperature, or from other causes affecting the atmosphere. For from experience it would seem, that without oxygen the vascular system would cease to act; and as any defect of this principle would be felt more immediately upon that part of the system where the greatest torpor prevails, it would thence follow, that the circulation in the brain would be more readily affected than in any other part.

But this irritability of the general system of the brain happening in age, and opening, by Apoplexy, a necessary and natural avenue to death, must be cautiously distinguished from affections of that organ, which may happen at all periods of life, as from hæmorrhage by external accident, or from the diseased state of the coats of a vessel or vessels, such affection being a mere local disease.

And this opinion, that, if life were not prematurely terminated by the intervention of accidental diseases, from contagion, intemperance, or other means, and if the living powers had their play unimpeded, and the preordained or necessary change from life to death proceeded in the most regular and natural manner, it is probable, that the approach of death would take place either by Apoplexy interrupting the circulation of the brain, from the diminished irritability of its vessels, as above explained, or by gangrene in the extremities, which being placed the most distant from the heart, the centre of motion, enjoy a less active vitality, and of course would soonest, by loss of circulation, undergo the change from life to death; is greatly confirmed by the sentiments of Professor Walter, who has expressed himself on this subject in the following manner. "*Plurimi hominum diuturnam sibi optant vitam; si ideo tales decrepitos investigamus, videbimus omnes homines ætatem senilem adsequutos aut Apoplexia aut gangrænosa inflammatione remotissimarum partium corporis, e. g. manuum vel pedum, mori. Si itaque comparemus modum mortis hominum summæ senectutis, qui vel Apoplexia vel inflammatione sphacelosa perierunt, tum experientia docet, ex decem talibus decrepitis* certè

certè novem Apoplexia, decimum verò inflammatione gangrenosa mori. Hæc contemplatio nobis jus tribuit dicendi, modum quo in senectute morimur, planè simplicem esse."

In this view of Apoplexy as a necessary cause of death, or as the result of the changes necessarily incident to the body from age, a reason will occur why its effects are so rarely wholly removed; and from this view, Dr. L. may, perhaps, experience some feelings of regret, when he reflects upon the intemperate, the indiscriminating intrepidity of conclusion which he has exercised, and upon the zeal and confidence with which he has spoken upon this subject; a mode of conduct equally unworthy a liberal and judicious Inquirer.

This theory, it must be confessed, is humiliating, as it places the means of relief and indications of cure, in much doubt and uncertainty, by making this disease, frequently, a mere expression of waning or departing life; but such as it is, I submit it to your readers, and, desiring that it may be received with doubt, and examined with caution, I shall conclude, in the spirit of the Elian Philosopher, whose name I have assumed, although with the words of a Christian Father, by saying, "Magis eligo cautam ignorantiam confiteri, quàm falsam scientiam profiteri."

PYRRHO.

On P S O R A.

OBSERVING in your valuable Journal, Mr. Ring's Observations on that cutaneous Eruption, termed Psora, induced me to make a few remarks on the same subject, having experienced, in many instances, the ill effects of the external application of corrosive sublimate in this, as also *many other* cutaneous affections, by frequently inflaming and excoriating the cuticle where applied, rendering the remedy much more tedious and painful than the disease. Although I have seen good effects from the application of Mr. Ring's ointment in several trials, still it is liable to the same objection; confident of this, and to obviate every inconvenience arising from irritation, was my sole motive for introducing the following formulas and plan of treatment, which I have invariably pursued with success beyond expectation.

No. 1. R. Calx Hydrar. Alb. ʒij. Cerufs. Acetat. Kali. pp. aa. gr. x. Ung. Simpl. ʒij. M. cum Essent. Bergam. et Lavend. aa. gtt. xx. ft. Linm. omni noct. utend. h. s.

No. 2.

No. 2. R. Calx Hydrar. Alb. ʒj. Calomel pp. ʒj. Lac Sulph. ʒij. Essent. Lavend. & Bergam. aa. gtt. xxv. Adeps Suillæ ʒij. M. applicetur omn. noct. h. s.

The preparation of fulphur in this latter liniment is devoid of that disagreeable smell which generally accompanies the other preparations of this kind, and seldom predominates: they are very neat applications; and it is rarely necessary to apply them more than two or three successive times, before a perfect cure is obtained.

In cutaneous and scurfy eruptions of the head, and extending behind the ears, frequently observed in infants, where a thin ichor sometimes pervades the cuticle, and almost excoriates when it is suffered to remain, I have found the following liniment, as a general application, of considerable utility, and seldom fail of effecting a radical cure.

R. Creta pp. Calx Hydrar. Alb. aa. ʒj. Cerufs. Acet. ʒj. Ung. Hydr. Nitrát. ʒij. * Unguent. Pice ʒij. M.

Although I am extremely averse to precise formulæ, yet cannot avoid recommending the above, the efficacy of which is surprising, when regularly applied; it absorbs and corrects the acrid virus, whether from a venereal taint, or any other acrimonious eruption, so frequently to be observed in children, particularly on the head. It should be applied every night, covering (at the same time) the parts with a bladder, or linen; and washed off in the morning with soap and water.

Alterative medicines are sometimes necessary to be administered at the same time; and of those, small doses, and such preparations as are not likely to pass by stool.

R. Hydrar. cum Sulph. Magnes. Calc. aa. g v. M. ft. Pulvis.

Or a $\frac{1}{4}$ or $\frac{1}{2}$ a grain of calomel given every, or every other, night, may answer the purpose equally well, as the practitioner may think proper. The doses must be varied, according to the age, constitution, &c. of the patients; and if acidity abounds in the first passages, should be combined with absorbents, such as creta or magnesia, as the bowels may be more or less affected. It will be necessary to observe, that the bowels must be kept gently open.

April 28, 1802.

N. G.

* If this liniment is found too hard, a little olive oil may be added; or, if tar ointment should be objected to, on account of its colour or smell, lard may be substituted.

On Sedative Efficiency; communicated by Dr. KINGLAKE.

NO question in Physiology has been less satisfactorily agitated than that which divides the medical world on the operation of sedative substances. The prevailing opinion, however, seems to be the least defensible, and to have been adopted much too gratuitously to be entitled to admission.

It is familiarly imagined, that certain substances act on the animal economy as direct sedatives, that is, that they repress the action of motive power; but those who entertain this opinion do not feel equal facility, in assigning a reason for this extraordinary effect. It is roundly asserted, that inordinate action is diminished by some power in the sedative agent, capable of subduing the existing motive power.

The salutary as well as morbid actions of life, may be undoubtedly altered by the influence of medicinal substances; but no substance is capable of directly retarding vital action by inducing debilitating changes in the motive conditions of life; on the contrary, such atonic changes would tend rather to generate disease, than to serve as a remedy, as is evinced by all disorders of debility being characterised by more or less of accelerated and irregular motion.

It must be evident to common observation, that diminished motive power is inseparably connected with proportionate celerity of action; this is strikingly exemplified in the latter stages of acute, and in the usual progress of chronic diseases, particularly those in which nervous affection predominates. The doctrine therefore of substances operating sedatively, by debilitating or directly abstracting motive power, seems wholly untenable.

Sedative influence may obtain in two different ways, either by universally exciting and invigorating the system, or by withholding or prohibiting excessive stimulation; in the former order of efficiency may be ranked whatever may be capable of subduing, by congenial excitement, morbid debility and its consequent quickened action; in the latter may be included a suitably reduced temperature, abstinence, increased evacuations, shaded light, and mental depression.

The mode in which these positive and negative powers operate, is formally opposite but efficiently similar; the one retards hurried action by the superceding influence of accessorial vigour, while the other obviates undue exhaustion by withholding noxious excitement.

These different species of sedative power are applicable to opposite states of disease; the positive influence is adapted to restrain

restrain and controul the quickened action of debility, while the negative is suitable to diminishing immoderate excitement.

If, then, morbidly accelerated action, in all cases of debility, originates from a weakened state of vital power, and can only be retarded and invigorated by imparting additional force to the reduced power, it is obvious, that effects positively sedative can only be sought for in the use of the most efficient narcotics, tonics, and stimulants. Thus experience confirms, that quickened action, whether, particularly agitating the arterial or nervous systems, is most effectually repressed by opium, digitalis, hyoscyamus niger, cicuta, belladonna, nicotiana, cinchona, cascarella, angustura, ferrum, zincum, cuprum, alumen, ammonia, æther, camphora, moschus, valeriana, asafœtida, &c. and above all, by pure air, small quantities of nutriment at short intervals, with suitable exercise, tranquillity, and sleep. In proportion as these agents operate salutarily, the diseased celerity of action will be retarded, and in the exact ratio of returning slowness will be the increased firmness of the motion. In the action of the arteries this improved vigour will be denoted by augmented fulness and softness of the pulse; in the nervous system by steady and commanding sensations; in the muscular structure by firm and unwearied exertion.

When vascular plenitude, distension, and the re-active violence of comparatively unimpaired tone induce either local inflammation, or acute general disease, the excessive action demands the most efficient influence of sedative power; but the effect under these circumstances can only be rendered negative by abstracting or diminishing the force of the stimulant powers before specified.

It is of the last importance rightly to discriminate the mode of sedative operation, that effectual means may be occasionally resorted to for its accomplishment. In the common acceptance of sedative power, a debilitating plan of treatment would be universally held to be conducive to its best effects; but which indeed would tend to increase the cause of the disorder requiring real sedative aid, and would probably render it too inveterate to be afterwards overcome by the most appropriate means of cure; on the other hand, in these cases of vigorous action demanding the negative effect of sedative power, agents possessing positive efficiency might be employed, such as opium, digitalis, hyoscyamus, nicotiana, &c. to the manifest increase of the disease, by causing additional excitement.

The effects which digitalis produce in the vascular system, have been held as an unquestionable proof of its debilitating operation. It is true, that its influence renders a rapid pulse

slow; but it is equally true that this effect is never produced without a proportionate increase of tone and fulness being afforded to the pulsations. This change proves, that what has been lost in celerity has been gained in strength, and that the agent producing the effect has augmented, and not diminished vital energy.

The effect of digitalis, when it operates salutarily, (that is, when its influence equally pervades the system, imparting congenial excitement approaching to the healthful stimulation of natural powers) is to retard rapid action, and to obviate undue excitement by equilibrating and energising vital power.

No difficulty is experienced in admitting that want of tone in the system is designated by inordinately quick and irregular action; yet, by a strange perversion of reason, it is supposed that this atonic effect may be resisted by increasing the existing debility. The retarding and tranquilising influence of digitalis has been thus explained even in opposition to the strong testimony to the contrary, afforded by its tonic effects in phthical, hydropic, and hæmorrhagic affections. In these cases, tottering feebleness marks the advanced degree of prevailing debility, as evidently as the accelerated and weakened state of arterial action. Would not increased debility, under these circumstances, aggravate the disease? And if digitalis acted as a debilitant, would it not speedily annihilate the toil-worn relics of life?

The theory that would contend for digitalis and other narcotic agents operating curatively in diseases of debility, by superadding to the existing weakness, meets an insuperable difficulty in assigning to them at once a debilitating effect on the arterial system, and an excitant influence on the lymphatic structure.

How such opposite effects can arise from the same power, on different parts of the animal body, does not appear, nor does any principle of philosophising, applicable to the animal economy, warrant such a contradictory inference; it has therefore been unscientifically assumed to subserve the delusion of a pre-conceived erroneous opinion.

What medicinal agent in other cases has been even supposed simultaneously to brace one part of the animal frame, and to relax another? Do cathartic substances debilitate the upper and invigorate the lower portion of the intestinal canal? Do diuretics weaken the secreting vessels of the kidneys, and strengthen the excreting tubes? Or do nervous stimulants impair the energy of the brain, and impart additional tone to its several distributions over the system? When these incongruous effects happen, then may it be admitted that digitalis, and other narcotic powers,

powers; diminish the action of the arterial system, and increase that of the lymphatic structure; or that sedatives repress the precipitate motion of debility, by lessening active energy.

It has not yet occurred to me to witness any instance of the salutary effects of digitalis, in which it did not evidently act as a narcotic stimulant, in which opium, hyoscyamus, and the various tonic and stimulant substances in medicinal use, would not have operated somewhat similarly.

Opium has indeed, in some phthical cases under my observation, proved a useful auxiliary, and occasionally, when nausea has inseparably accompanied the employ of digitalis, an efficacious substitute.

Whatever equally excites, and sustains the native energies of the system, will retard, soften, and fill the pulse. A moderate quantity of Madeira wine, alimentary refreshment, increased temperature, (particularly that of the warm bath) and pleasing intelligence, will restrain and invigorate the rapid motion of a debilitated pulse, as sensibly, though perhaps not so extensively and durably, as digitalis.

It has not happened to me to observe that any strengthening or beneficial effect has resulted from the employ of digitalis when it has induced distressing nausea. This effect is highly debilitating to the stomach, and sympathetically so to the system at large. The degree of sickness produced, may be accurately measured by the increased weakness and celerity of the pulse, and its progressive retardation and fulness will as correctly mark the subsidence of nausea. Certain constitutional idiosyncracies render the impression of digitalis wholly intolerable; instead of augmenting and equalising systematic energy, it embarrasses and disorders every movement. Similar effects sometimes arise from other stimulants, particularly from those of the narcotic class, and the excessive influence of all of them is often formidably deleterious.

Were it possible accurately to measure the precise degree of narcotic influence necessary to subdue morbid quickness of motion, curative effects might be confidently expected from its use in a vast majority of diseases; but instead of this certainty, the stimulant operation often unaccountably exceeds the standard of healthy excitement, and involves the powers of life in the equally irreparable difficulties either of excessive exhaustion, or of organic decomposition.

The desirable effect of narcotic substances is to alleviate morbid irritability and sensibility, by energising, and equally distributing the vital motion. Its soporific operation marks the excess of its stimulant power on the brain, and indicates the propriety of diminishing its force, lest by inducing a high degree

degree of indirect debility, its tonic influence should be counteracted.

Digitalis remarkably debiliates when it stupifies: It strengthens only when it lessens morbid sensation, by moderately invigorating and retarding arterial action. Its stimulant effect (like that of all other positive sedatives) is insufferably noxious in the early stage of acute fever, particularly under those circumstances of general irritation that prevail in visceral inflammation. It was lately given under my direction, on about the fourth day of a violent peripneumonia, accompanied with a rapid, hard, and contracted pulse, and much depression of strength. Though the dose was restricted to one grain at intervals of four hours, yet the third exhibition of this small quantity seemed to be distinctly followed by threatening delirium. Much additional difficulty arose from this medicinal interference of hurtful power. The patient struggled, alternately comatose and furious, during three days and nights, from which state blistering and bleeding appeared at length to have relieved him.

On the eighth day, much systematic debility and morbid irritability of the lungs prevailed, with laborious respiration, an irregular, extremely feeble, and rapid pulse; so much so indeed as to be at intervals either countless, or wholly imperceptible. The digitalis was now resumed, one grain of the powder was given every four hours; the effect was all that could be desired, after a few doses of the medicine the pulse filled, softened, and became slower, every morbid symptom abated; the medicine was continued about a week, during which time progressive amendment insuring ultimate recovery, induced a neglect of its farther use.

Another case since occurred of peripneumonic affection, which did not come under my care until the seventh day of its progress. Much systematic debility and pulmonic irritation prevailed, with almost incessant cough, difficult respiration, dry heated skin, and a weak, rapid, hard pulse. The tincture of digitalis was directed in doses of fifteen drops every four hours; on the second day the symptoms were alleviated. The dose was then extended to twenty drops at the same intervals; on the third day the pulse became sensibly more soft, full, and slow; the urgent cough and embarrassed respiration were much relieved; when a salutary determination on the cuticular exhalants at once moistened and cooled the surface. No obstacle happened to the course of convalescence, which soon terminated in perfect recovery.

My motive for troubling you with these extensive remarks on the effects of digitalis, is to oppose the prevailing opinion of
this

this agent operating as a *debilitant* sedative. My attention has been more particularly invited to this subject, by observing in a late Number* of your Journal, some animadversions offered by one of your very intelligent correspondents on the sedative effect of Digitalis. The author alluded to has quoted a note to a former paper of mine, in which my objection to the theory of absorption is generally made. My opinion of the lymphatic vessels being passive tubes, designed to transmit the fluid forced into their permanently open orifices by arterial and muscular impulse, is opposed by the authority cited, by the known effect of Digitalis in removing serous fluids from cavities under an apparently diminished arterial and muscular power. On the slowness and celerity of the pulse must the dispute be at issue. The question then is, whether the weak, swift pulse, denote more systematic energy than the comparatively slow, full pulse, which results from the beneficial employ of digitalis? The arterial action in a state of health, and the approaches made towards it in all cases of morbid debility, under the recruiting and stimulating effects of alimentary and tonic aid, would seem to prove that a slow, full pulse, is founded on more strength than that which is weak and rapid, and therefore that digitalis is a *stimulant*, and not a *debilitant* sedative; that it invigorates the active powers of the system, that it consequently augments the arterial and muscular impulse, and that thereby may be explained its efficacy in removing serous effusions by forcing them into the lymphatic circulation.

In another publication,† my reasons for believing in *non-absorption* and the passively transmitting office of the lymphatics are given to some extent. It may be here sufficient to observe, that the structure of the lymphatic tube is destitute of every requisite for active exertion, while it is provided with every convenience for admitting and facilitating the passage of the lymphatic fluid; that it is so extremely slender in its fabric as to be diaphanous; that its cavity is highly polished, and studded at short distances with valvular obstacles to reflux; that it has no apparent muscularity; that it is insusceptible of contraction from either mechanical or chemical stimulants; that the latter (more particularly such as the mineral acids) may decompose and corrugate its substance, but in no instance have they given satisfactory proof of muscular action; that its orifice is elastic, permanently open, and inirritable to any exciting agents; that

* See Medical and Physical Journal, No. xxxvii. p. 197.

† See Cases and Observations on the Medicinal Effects of Digitalis Purpurea in Phthisis Pulmonalis, &c. by Robert Kinglake, M. D.

that its texture is too slight to endure the shock of active absorption, and propelling contraction; and, finally, that its passively transmitting function is equally verified by the phenomena of health and disease. The impulsive and propulsive powers in the healthful state of the animal œconomy, insure a regular reflux of lymph.

In the acute periods of either febrile, or other violent affections, the lymphatic circulation is so precipitated, as to cause a deficiency of exhalant fluid in the cellular and interstitial cavities; while in chronic maladies, a want of adequate circulating power is apt to occasion a redundancy, and an accumulation of it. In the one case, debilitating or negatively sedative powers would tend duly to moisten the cavities; in the other, additional stimulant power (such as *Digitalis* and other analagous agents eminently afford) would force into the lymphatic circulation the exhaled and stagnant fluid.

Chilton, super Polden,
May 14, 1802.

ROBERT KINGLAKE.

To the Editors of the Medical and Physical Journal.

GENTLEMEN,

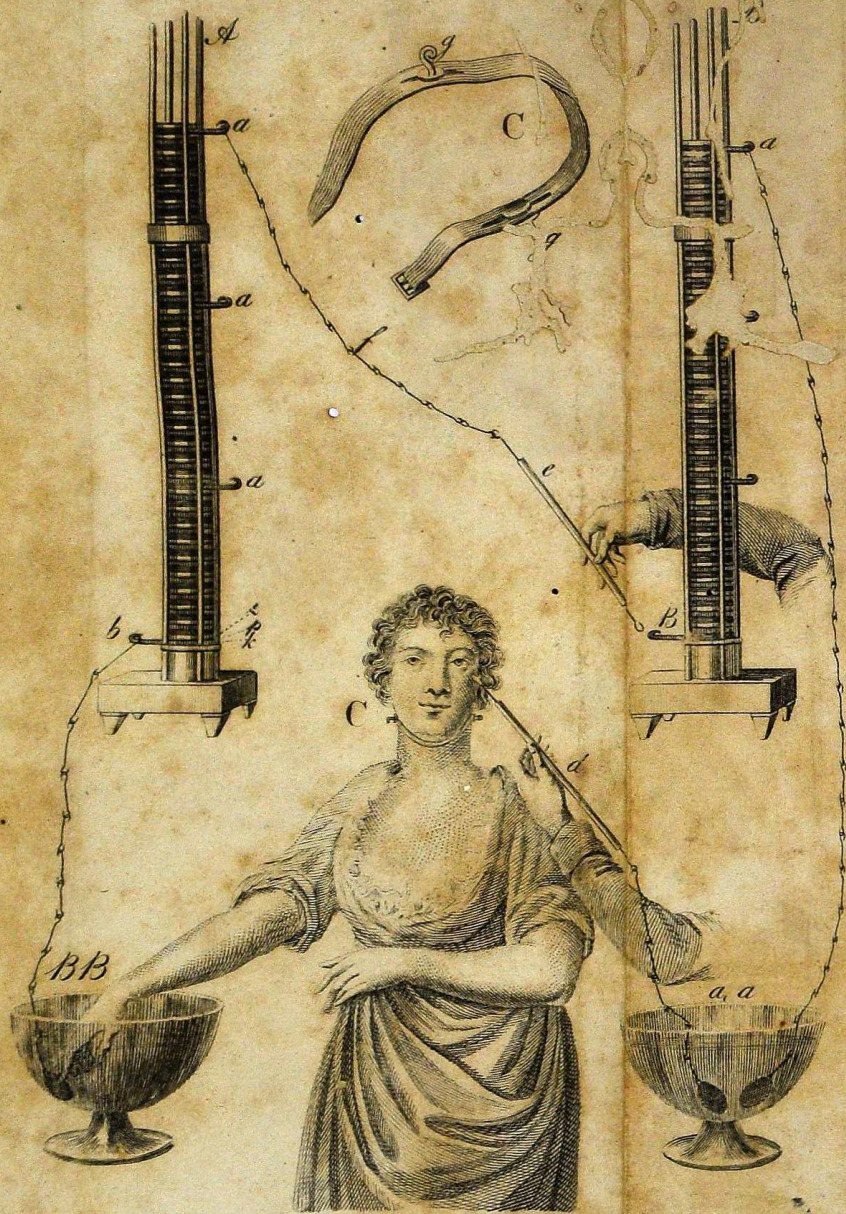
AS we perceive you are continuing to give Testimonies in support of the Vaccine Inoculation, we have transmitted you a copy of one that was forwarded to Dr. Jenner, from the Colchester Medical Society, in November last; and by him laid before the Committee of the House of Commons; and wish, if it meets your approbation, it may find a place in your useful Journal.

COLCHESTER MEDICAL SOCIETY.

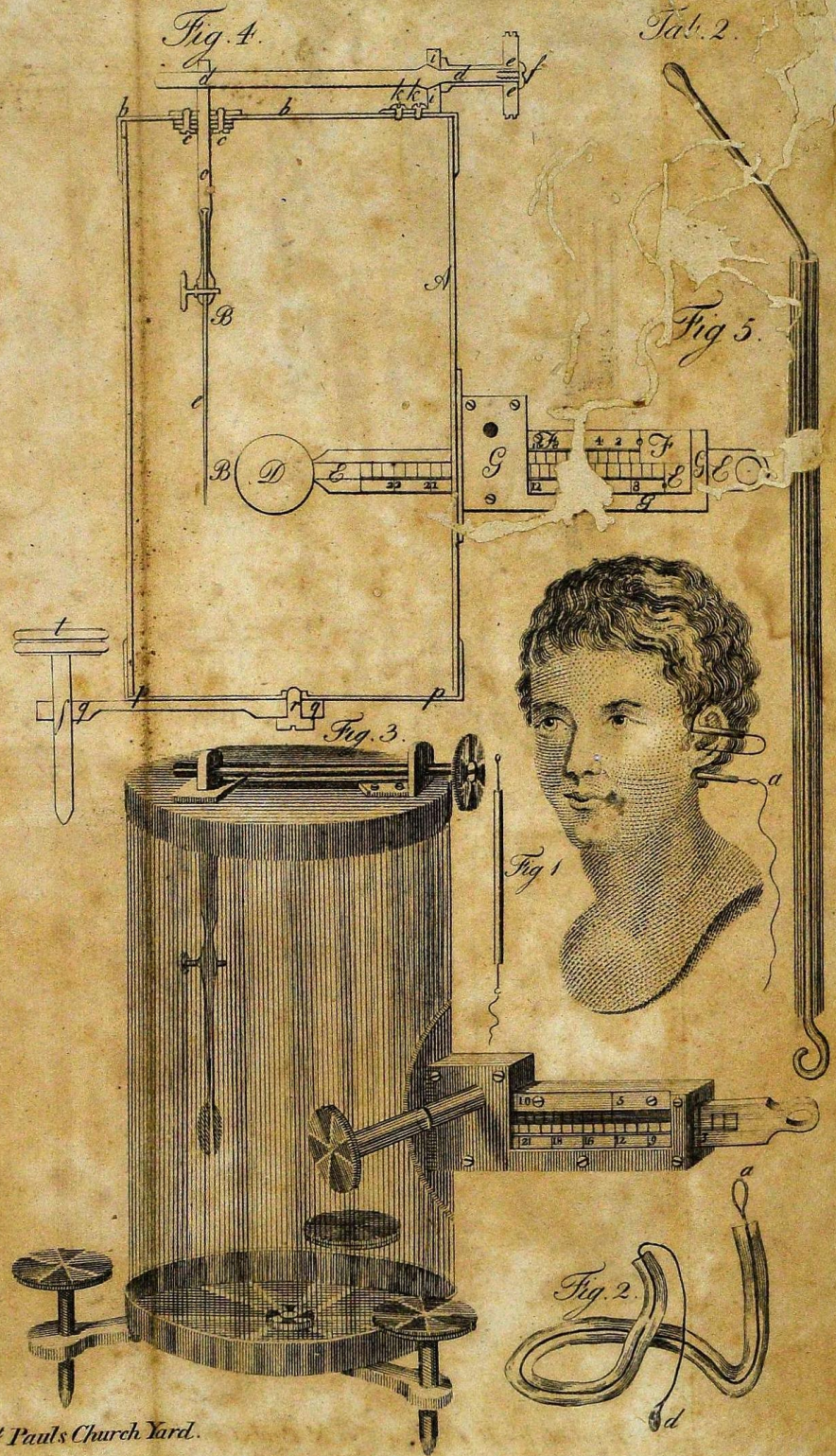
Established A. D. 1774.

We the undersigned Members of the Colchester Medical Society, having for some time practised the Vaccine Inoculation with uninterrupted success, and so fully satisfied of the great importance of the discovery thereof to mankind, and its efficacy in securing the habit against the infection of that dreadful and frequently fatal disease, the Small-pox, as not only to have recommended it generally in our practice, but to have adopted it in such parts of our own families as have not had that disease; feel it incumbent upon ourselves, to testify our gratitude

Galvanic Apparatus
for Medical purposes



Medical Journal N^o.40



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tude for the exertions you have with such steady perseverance made in endeavouring to eradicate one of the severest scourges of the human race.

Our sanguine hopes are, that time will in an equal degree tend to establish your reputation and extinguish this baneful malady, and that generations to be born not long hence will be as ignorant of its effects as the ancients were of its name.

To you therefore we readily pay such thanks as are due to *one*, who, directed by "the Giver of all good gifts," has been the instrument of conferring upon mankind so important a benefit. If in the expression of these thanks we have not been so early as some, let it not be imagined that our gratitude is less prompt, or our sense of the advantage derived to society less strong, but rather, that we wished for the sanction of time and experience to ratify the Declaration, which we have now the honor to transmit to you.

R. R. NEWELL,
P. GRETTON,
J. GODFREY,
T. C. HARROLD,
H. NUNN,
J. HOPKINS,

W. TRAVIS,
B. SMITH,
W. SILKE,
G. ROGERS,
J. BAILY,
T. LANE, Surgeon, Royal
Artillery, (visitor.)

November 10, 1801.

On GALVANISM and its Medical Application;
*by Dr. BISCHOFF.**

[With Engravings.]

THE discovery of the Galvanic stimulus, which has of late been the subject of so many curious researches to Naturalists, was prefaced by Valli, Hufeland, and Reil, to prove of the utmost importance and utility to therapeutics from the great effect it showed on organism; but particularly since the time that Mr. Volta succeeded in producing the effects of the Galvanic power in a considerable degree by the construction of the remarkable apparatus, which now generally bears the name of Volta's pile or column, we may expect to reap the most extensive advan-

* The author has made this interesting inquiry the subject of his Inaugural Dissertation, entitled, *De usu Galvanismi in arte Medica, Jenae MDCCCI, c. tab. aen.* in which he has premised a brief survey of the progress made in the knowledge of Galvanism, and of which we suppose the following paper to be for the most part extracted

tage from the medical application of so powerful and penetrating a stimulus. The construction of that apparatus is founded on certain laws which the Galvanic agent is found to obey, according to the ingenious researches of Volta and Ritter, who discovered that its effects arise from the contact of three heterogeneous bodies, a fluid or moist one and two solid ones, the last of which belong the metals, ores, coal and molybdena, and to the fluid bodies particularly those which are the most saturated with oxygen. The column consists of round metallic plates, which represent the Galvanic chain, with which the fluid (diluted muriatic acid) is brought into contact by means of round pieces of pasteboard, soaked with the acid fluid. When these single Galvanic chains are placed one upon another in a greater or less number according to the effect which is intended to be produced, the apparatus appears as a column, which is put between four glass pillars both for securing it properly and for insulating it; and it is kept together above and below by means of a case made of wood or metal. The whole is insulated by placing under it some glass plates; instead of which I found it more convenient to place the column on a pedestal, insulated by four glass feet. When such a column is constructed, according to Volta, in the following series, silver, zinc, pasteboard; silver, zinc, &c. the metallic plates, which happen to be at the two ends of the column, ought properly not to be regarded as active, because it is found that the two heterogeneous metals act only upon each other through the medium of a moist body. Hence it appears, that the phenomena produced by the two ends of the column, which are called poles, are not to be ascribed to the metallic plates ending the pile, but to those which are between them; and in a column therefore thus constructed the phenomena appearing at the last silver plate, are properly owing to the zinc placed under it, or to the zinc pole; and, vice versa, the phenomena produced at the last zinc plate belong accordingly to the silver pole, for thus the two ends of the column are named, of which the silver pole shows positive and the zinc pole negative electricity. These poles manifestly differ in the quantitative as well as qualitative action they respectively exert on organism, a circumstance which I have not only witnessed in ten or twelve patients that fell under my care, but also found by frequent experiments I had otherwise an opportunity of making. The difference in the respective action of the poles appears to take place,

I. *In the general excitement and in the affection of common sensation.*—The action of the two poles however seems to differ more in quantity than in quality; for though the sensation

tion produced on touching the zinc pole rather resembles a shock, the sensation at the silver pole consists in a very sensible oscillation of the nerves, which extends itself along their branches, yet the difference seems merely to depend on the degree of irritation, and consequently its quantitative, because I think I have perceived the last sensation even at the zinc pole, when the battery acted in a less degree. But it remains notwithstanding problematical, whence this quantitative difference arises.

II. *In the symptoms of the general irritation of organism produced by the topical irritation of single organs, viz.*

1. *In the affection of the organ of taste.*—It has been repeatedly observed by the above patients, and in the experiments which I made on myself, that on bringing the tongue into contact with the zinc pole, a remarkable sourish taste is perceived, which on the application of the tongue to the silver or copper pole is found to be more saline-alkaline. It is likewise remarked, that the affection of the organ of taste is not only more intense, but also more lasting at the zinc pole than at the silver or copper pole.

2. *In the affection of the organ of sight.*—On combining the eye with the positive pole, the colour of the lightning that is thus produced in the eye will appear light blue or greenish, whereas it is fiery or reddish at the eye being brought in contact with the negative pole; but the intensity of these colours depends on the strength of the battery. This production of light and colour in the eyes seems, however, to be nothing but a symptom of general incitation, on account of its taking place without a topical irritation of the organ of sight, a phenomenon frequently observed in my experiments; for whenever I placed myself within the course of the Galvanic chain by my hands, I perceived a faint glance and oscillation in my eyes, and also several of my patients made the same remark, particularly on the first time of its application, when they were not accustomed to the stimulus; the objects appeared to them lighter and clearer than usual.

3. *In the affection of the organ of hearing.*—There seems only to exist a quantitative difference in the action of the poles on the organ of hearing; and the sensation produced in the ear by the application of Galvanic fluid is much more intense and of a longer duration at the zinc pole than at the silver pole.

Notwithstanding this difference in the respective action of the two poles, the phenomena produced by both poles are evidently symptoms of irritation, though they be not attended with an increase of the pulse, of animal heat, and of the secretions and excretions. It is to be remarked, that the sensibility

of the patients, particularly in the beginning, increases by degrees during the application of Galvanism, and that, consequently, at the same degree of the Galvanic action without any direct increase of stimulus, the affections of the senses as well as the contractions of the muscles become more violent. The phenomena, therefore, which the Galvanic stimulus produces on the organic body, naturally lead us to conclude, in what diseases it may be successfully employed. In all affections, therefore, where the organs are deficient in a proper degree of incitation, either from direct or indirect debility, consequently in amaurosis, paralysis linguæ, either originating in the nervus lingualis and sublingualis, whereby the taste is affected; or arising from the nervi laryngei, whereby the organ of speech suffers; farther, in that species of deafness which originates in a paralysis of the acoustic nerve; in all cases of paralysees of single limbs, chronic rheumatisms, ischiatic, and in gouty complaints, the application of the Galvanic power may prove of the greatest effect. With this view I have employed Galvanism in several diseases, and, I may venture to say, with considerable success; but before I communicate the history of these cases, I beg leave to premise some remarks on the battery itself, and on my manner of applying it. My apparatus (see Tab. I. fig. A. A B.) consists of a tin plate with its margins bent upwards, which is insulated by four glass feet; on the middle of this plate is a square pedestal, likewise a tin plate, of the size of a cube of the diameter of one of the largest metallic plates used for the pile; on the middle of each of the four sides of this pedestal is soldered a tin tube, receiving the four glass pillars, between which the pile is to be constructed: These glass pillars are kept together above by means of a metallic or wooden hoop. The whole pedestal is varnished to prevent its rusting. The zinc plates are of the size of a crown piece, and double the thickness: Instead of silver I use copper-plates; and the series in which I construct the pile, is copper, pasteboard, zinc, alternately, so that the copper pole in my battery is at its lower end. In order to prevent the fluid that happens to be expressed from the pasteboard getting between the two metallic plates, I let the copper-plates be made a little larger than the zinc plates, so that they project about two or three lines beyond them; for when some of the fluid is pressed out of the pasteboard that is above the copper-plate, it cannot get between the zinc and copper-plates, but dropping down on the next copper-plate it is absorbed by the pasteboard above it. The fluid, thus expressed, is collected on the lowest plate of copper, where it can be from time to time easily taken away by means of a syringe, which I always make use of to wet the
pasteboard,

pasteboard, if the battery is not fresh constructed. I think it however more convenient, on account of the trouble which it requires to clean the plates after they have been used several days successively, to construct the pile fresh every day. By this means the efficacy of the battery will not be prevented by the oxydation of the metals, which takes place by the continued use of the pile. In order to adapt the strength of the battery, which consists of one hundred plates, to the state of incitability of the different patients, I got two additional hooks (a a) made in the middle of the pile, on which the conducting chain may be applied according to the degree of action requisite: And to determine the proper degree of action more accurately I have proposed a *Galvanometer*, the description of which is given at the end of this paper. As the pile might be easily overturned by the starting of the patients, I place two bowls ($\alpha \alpha \beta \beta$) filled with a solution of common salt, at some distance into which the conducting chains of the two poles are immersed, and from thence, by means of other chains, the application to the affected organ is made.* The manner in which it was performed will appear from the following Cases.

Case I. A man, forty years of age, whose situation in life exposed him to frequent colds, was on a sudden affected with a dimness of sight, which, in the course of two years and a half, terminated in complete amaurosis of such a degree that he could hardly distinguish the largest objects, which appeared to him as distant shades. I began my experiments with seventy strata of plates, and conducted the chain of the negative pole partly to the region of the nervus subcutaneus malae, partly to the nervus frontalis, supraorbitalis, infraorbitalis, to the eyelids, and at last to the sclerotica. Having thus continued for three or four days, without the expected success, I constructed two batteries, each of sixty strata, in the following series—copper, pasteboard, zinc, copper, pasteboard, zinc, &c. (Tab. I. A. K. p. z.). Having combined the zinc pole of one battery with the copper pole of the other by means of a wire, I conducted the zinc pole and copper pole into the two bowls filled with salt water, and ordered the patient to immerse his hand into that vessel which contained the conductor of the copper pole, while I brought the zinc pole in contact with the eye
of

* On this mode of conducting the Galvanic action into a fluid, Dr. Froiep of Jena built his proposal in his Inaugural Dissertation, *Diss. de methodo neonatis asphycticis succurendi*; — to use Galvanism as a means of vivifying infants in the *asphyxia neonatorum*, by conducting a chain from one of the poles into a bath, in which the child is laid, and another chain from the opposite pole to the child itself.

of the patient by means of an insulated probe, to which the conductor from the other vessel had been fastened. The patient saw frequent lightning, perceived a burning sensation, and had from time to time strong muscular contractions at the places that were touched. When I had thus continued for above five weeks, twice a day, and increased by degrees the shocks given at each time round the eye from 100 to 200, and those applied to the sclerotica from 8 to 16, and not finding any considerable effect, I added thirty strata of plates to each battery, by which means the lightning became more intense. When I had applied this battery for about fifteen days, I had the satisfaction to be assured by my patient, that the lightning appeared to him much increased, and to extend over the whole eye; and that he perceived, three or four hours subsequent to the application, a particular light in the eye: The patient could likewise, since that time, distinguish the reddish lightning of the negative pole, and the bluish colour of the positive, which I considered as a step towards recovery. Induced by these favourable symptoms, I continued the Galvanism, in the application of which, however, I made a remarkable alteration, for the purpose of affecting a more perfect current of the Galvanic fluid through the body. With this view I disjoined the chain which combined the zinc pole of the battery A, with the copper pole β of the battery B, and made to it a silver probe, passing through a glass tube, by which it was insulated (Tab. I. e.) I then conducted another silver probe from the zinc pole α of the second battery through the vessel $\alpha\alpha$ and applied it to the eye; the hand, however, was brought in contact with the copper pole b , by means of the vessel $\beta\beta$, and thus the Galvanic chain was shut. My expectations were by no means disappointed, as the effect of the Galvanic agents was considerably increased, the lightning became stronger, and the muscular contractions more violent, in such a degree, that I found myself obliged to diminish the number of the shocks from two hundred to one hundred or one hundred and fifty, and of those that were immediately applied to the eye, from twenty-four to 12 or 15. I applied, at the same time, the silver probe to the septum narium, sometimes higher up, sometimes lower down, while I shut the chain in the above manner. This mode of application acted as the strongest sternutatory, and produced a most intense lightning in the eye. The greatest affection of the sight, however, appeared if the patient was not brought in contact with the copper pole of the combined batteries by the hand, but if a probe was immediately conducted from this pole to the head, eyes, or the septum narium. But as Mr. Ritter has discovered, that while the state of light in one

one eye produced by the negative pole is increased, that at the positive pole is diminished, which I also supposed to take place in this manner of making the experiment, I scrupled to bring the patient frequently within the Galvanic chain in that manner. This increased action of the Galvanism being continued for above a fortnight, twice a day, the patient seemed to make a more rapid progress towards recovery than before; and on the 29th of June, (I had begun to treat the patient from the 11th of May) the patient was able to perceive light in the eye, when the Galvanic chain continued to be shut, in consequence of the lightning produced at the zinc pole. This sensation daily increased, and he perceived it also at the positive pole: The patient found, at the same time, to his utmost satisfaction, that he could distinguish the out-lines of the objects, which he had not been capable of before. About this time, when the patient conceived the greatest hopes of recovery, I was prevented from continuing the cure, being obliged to leave the place where the patient resided; but I am in hopes, that by a continued use of Galvanism he will be enabled to distinguish the objects sufficiently, should the obstinacy of his complaint not allow a complete recovery of his sight.

Case II. A country girl, 20 years of age, of a bloated habit, had been affected for above a twelvemonth with a dimness of sight, which permitted her to distinguish only large objects, and the white and black colour, and which made every thing appear as if obscured by clouds. This complaint seemed to have arisen from a retention of the menses, originating in a direct debility of the system; and from the same source are to be derived the epileptic fits which had from time to time attacked her; after the cessation of which, the weakness of sight had begun and increased to the degree in which it was at present found. She had been treated with the most efficacious remedies, but without much success, till I determined to try what the application of Galvanism might do in this case. The apparatus was accordingly begun to be used on the 12th of May, after the same manner as in the Case before-mentioned, but not in such a degree as had been there required; it shewed, however, a quicker effect than in the former case, and the patient perceived, on the 16th of May, (immediately after the application of Galvanism,) some light in the eye, which continued for a few moments. Meanwhile the patient had symptoms of menstruation, which I endeavoured to support by medicines, in order to produce a full effect, but without the expected success. The sight of the patient, however, improved daily, so that she could some days after distinguish the lighter shades of an engraved portrait at one step distance,

tance, and a few days after the hand and fingers on it, and even the letter-press under it. On the 12th of June, the signs of menstruation returned, but they could not by any means be brought to flow. She began now to distinguish colours, and at first the dark ones; eight days after the other colours; and, on the 28th of June, she was able to distinguish common letter-press. On the 2d of July, she was able to knit and to work with her needle, and easily distinguished the physiognomy of the persons that were about her. As the signs of menstruation appeared again from time to time, the patient was ordered to take one night, *Pilul. balsamic. Hoffm.* ʒj. *Extract. taxi gr.* ij. with a tea of *flor. Arnic.* and *chamomill. Roman.* but this had not the intended effect. About noon the next day, the Galvanism being applied to her as usual, the menses appeared half an hour after, and continued for three days, shortly after the application of Galvanism; which is the more remarkable, as a topical irritation of the genitals, by conducting one pole to the labia pudendi, and the other into the vagina, had not before been capable of producing a similar effect.

Case III. A woman, aged 28, of a lean habit and yellow complexion, had been brought to bed in December, 1800, but since that time the right side, right arm and leg, became quite paralytic, the pulsation of that side was very weak, and the animal heat considerably diminished; the tongue was likewise palsied, speech and taste almost entirely abolished. No fever, however, and all other functions in just order. She was ordered to take belladonna with opium, which, being used some weeks, raised the pulse a little; but as no other step towards recovery was perceived, recourse was had to electricity. After it had been applied for three weeks the patient received some motion in the arm, which favourable symptom however disappeared from time to time, without any evident cause. But though the efficacy of electricity was again supported by the internal use of belladonna, no great progress in the cure could be perceived. On the 11th of May, I proceeded to the application of Galvanism, after I had previously ordered the former remedies to be discontinued. In the beginning I brought the patient only by the hands within the Galvanic chain, which produced, by degrees, violent contractions in the paralytic arm; but, a few days after, I conducted the copper pole immediately to the tongue, by means of an insulated probe, which caused vehement contractions and an alkaline taste, together with an increased secretion of saliva. The copper pole was also alternately conducted to the region of the nervus vagus, and to the pharynx and larynx. The convulsions in the diseased arm appeared more violent at the zinc pole, when the copper pole was con-

ducted

ducted in the above manner, than if the conductor was merely applied to the left arm. After having thus continued the application of Galvanism, several favourable symptoms appeared; she could move the paralytic arm, the pulse and animal heat of which were considerably restored, so as to become nearly the same as in the sound arm, and she found herself more easy. Eight days after I had increased the strength of the battery, the patient could, though with some difficulty, raise the arm to the head, and at the same time she made some efforts to speak; but it was not till some days after that she could utter a few words clearly and distinctly. The progress which she made in the faculty of speech by no means kept pace with the other symptoms of recovery, though I conducted the Galvanism to the region of the larynx, after I had previously excoriated it by means of a blister. The patient, however, could now lift and stretch the hand towards the head; pulse and animal heat were the same in both arms, taste was likewise restored, also the affected leg was in a better state, and she began to walk pretty steadily. The dullness in which she had been all the time seemed to have disappeared, and there was no doubt that the perfect recovery of motion and sensation in the affected organs, would be attained by the continued application of the Galvanic stimulus.

Case IV. A man, aged 50, who two years ago repulsed an itchy eruption by the imprudent use of astringents, had ever since that time been afflicted with a chronic asthma, and an arthritic affection in the right shoulder, which hindered him from moving that arm, and it always caused him much pain when he attempted it. The patient having used the common remedies without much avail, was galvanised from a battery of 70 strata. After having ordered the patient to immerse the hands into two bowls of salt water, I conducted the copper pole into the vessel in which the left hand was immersed, while I shut the Galvanic chain, by plunging and taking out alternately an insulated probe in the vessel into which the hand of the diseased arm was put. The patient perceived, at each time, a very sensible shock, and the flexores digitorum of the hand, at the zinc pole, contracted themselves; while, in the other hand, the extensors were put in action, so that one hand shut itself, and the other opened itself, each time the Galvanic chain was formed. The next morning, after the application of Galvanism, the patient thought himself greatly relieved, the pains had almost entirely ceased, and motion was pretty well restored. On the evening of the same day, however, an oppression on the breast, with a dry cough, supervened, which ceased entirely the same night, when the itchy eruption at the feet was perceived.

A few days after the application of Galvanism had been continued, the itch disappeared again, while the asthmatic complaints returned; the patient, however, could perfectly move his arm. Having the next day applied the Galvanism, from a fresh constructed battery of 80 strata, the eruption broke out again, which made the complaints in the breast entirely disappear. Some weeks after the eruption disappeared without any remedy; the patient remained free of any complaint, and was perfectly recovered. During this application of Galvanism the patient thought his sight, which was naturally weak, to have been considerably strengthened.

Case V. A man, aged 43, had been afflicted for above five years with the most violent epilepsy, which had brought on him such a debility that twelve grains of camphor, twice a day, had almost no effect in exciting him. He had used the most efficacious remedies without experiencing much effect, and the paroxysms returned once, twice, and sometimes three times a week, shortly after midnight; the patient was, at the same time, frequently vexed in day-time with spastic affections of the extremities and face. As I had reason to expect in this case some success from the application of Galvanism, I discontinued all other remedies, and began galvanising this patient by bringing him in contact with two batteries, each consisting of 60 strata, by means of his hands immersed in the two bowls of salt water, and by shutting the chain from without the patient. I rose by degrees from 40 shocks, which I applied on him twice a day, to about 200, and let him frequently remain for above five minutes within the chain, which last mode of application I particularly recommend, as acting without interruption on the senses. I had hardly applied the Galvanism in this manner a few days, when the external spasms ceased by degrees; and, after having continued about two months, the epileptic paroxysms intermitted to once in three weeks, and though they returned afterwards two days, one after another, the paroxysms generally made an intermission of a fortnight; and, what I also considered as a favourable symptom, it came on in the day-time.

Case VI. A labourer, 28 years of age, afflicted for above fifteen years with Epilepsy, was galvanised every day during three weeks, which had such beneficial effects that the paroxysms, which had before attacked the patient once a week, only recurred once within three weeks; I must however mention, that the patient used the flores zinci at the same time.

During the last weeks of my stay at Jena, where I made the above observations, I had an opportunity of using Galvanism in a case of deafness, originating in a debility of the organ; but though my time did not allow me to wait for the suc-

cess

cess of this cure, I shall take the liberty of communicating my method of applying the Galvanism in this and similar cases. It being particularly requisite to conduct the Galvanic agent into the internal ear, to the nerve and membrana tympani, I passed a thin silver probe through a glass tube which was bent in fire according to the form of the ear, as represented in Tab. II. fig. 2. It is hung to the ear. One end of the probe (d) is made sufficiently long to be applied to the membrana tympani, and the other end (a) has a hook, to which the conducting chain of the battery can be fastened. The conductor may be also insulated by silk, and bent in the above manner. After each ear had been provided with such a conductor, I fastened the conducting chain of the copper pole of the battery, consisting at first of sixteen strata only, to the hook of the conductor, Tab. II. fig. 1, a, at the ear that was least affected, while I shut the chain by means of an insulated probe (b) applied to the hook of the conductor of the other ear (c). When the Galvanic chain was shut in this way, the patient suffered a severe shock, and thought he heard the sound of a large bell, which continued as long as the chain was shut; and always a tingling of the ear remained for several hours. I have likewise tried to conduct one pole to the tuba Eustachii, which, though extremely troublesome and painful to the patient, is promising of much good. The best way of applying the probe is through the nose; on which account, however, we should insulate it properly, in order to prevent any disagreeable sternutation. This may be effected by covering the probe as far as it touches the sides of the nose with resina elastica previously dissolved in naphtha or ether. Having introduced the probe into the tuba Eustachii by means of the *tour maitre*, I combined the hook with the conductor of the copper pole, and shut the Galvanic chain by an insulated probe, conducted from the zinc pole. I have added to Tab. I. fig. C, the Galvanic collar invented by Dr. Grapengieffer for cases of Aphonia: It consists of a strap with a buckle, to which are fastened, by means of buttons and button-holes, a zinc plate and a copper or silver plate. Both plates are furnished with a hook, by means of which they are combined with the battery.

Description of the Galvanometer, Tab. II. fig. 3 and 4. — Mr. Ritter hung in a glass receiver a piece of gold leaf, and introduced a wire through a hole in the side of it; when a connection was made between the wire and the gold leaf, the opposite poles attracted each other. This experiment was several times repeated, and according as the effect of the battery was stronger or weaker the attraction took place at a greater or smaller

smaller distance. It was evident therefore, that a scale of the Galvanic action might be constructed by observing the distance in which the two bodies attracted each other. For this purpose it was required to take notice of the smallest variation of the gold leaf from the vertical line, and at the same time accurately observe the distance.

Fig. 4, Tab. II. is a sketch of the instrument. A, the sides of a glass cylinder upon which is a cover of metal, bb; the brass wire, o, passes through a hole, and is fastened by the springs at cc. It may be gently moved backward and forward by means of the micrometer screw, dd, the nature of which will be easily understood, vide ee, f, kk, ii, &c. EEE is a flat scale, moveable in the case GG, by means of a wheel and teeth. It bears the globe D, which is to attract the gold leaf, fastened to a piece of brass, BB, with a little gum; this piece of brass is fastened in the wire, o, by means of a screw, so that it may be taken out. The case GG, in which the scale EEE moves, is cemented to the cylinder with a round plate; here the case is larger and contains the wheel, into which the teeth of the scale work; the axis of this wheel is of glass, in order to insulate it. The case is open, in order to be able to see the divisions of the scale, which measures the distance between the globe D, and the gold leaf. On the case at F is a subdivision for the purpose of determining the lines in the scale. A stand with screws supports the whole. From the greater or less distance of the globe from the gold leaf, which is pointed out by the scale, we are enabled to determine the strength of the battery.

*Copy of a Letter from Mr. WALES, Surgeon of Market
Downham, Norfolk.*

TO THE EDITORS OF THE MEDICAL AND PHYSICAL JOURNAL,
Gentlemen,

AT the present period it may appear unnecessary to offer to the world farther proofs of the efficacy of Vaccine Inoculation; particularly as the practice has undergone such an ample discussion in your useful publication, since the period that Dr. Jenner first made public his facts and observations on that subject. But as there are still some persons both in and out of the profession who affect to entertain some doubt of its infallibility in preventing the Small-pox, I consider it my duty to society
to

to mention the success that has uniformly attended my experience, during the application of this mild disease to upwards of 540 persons, residing at, or within a few miles of this place.

As the symptoms attending the Cow-pox vary so little in the different subjects, and in my practice have not differed from cases, particularly related in your Journal by other medical gentlemen; it will not be necessary or useful to give more than a general account; suffice it to say, I have never seen an instance, where the patient has been considered either by myself or the family in any danger, nor have I observed any excessive pain, ulceration, or any other inconvenience attending the inoculated part, but such as have arisen from external injury, by which the pustule has been roughly broken, or from wearing sleeves too tight, and perhaps in female subjects in particular, made of very harsh materials. With respect to the perfect security afforded by the Vaccine against the Variolous disease, I can offer the fullest testimony, and to the extent of at least four out of five of the number before mentioned, having seen that proportion exposed to the latter disease, in every possible way; some of whom (my youngest child with the rest) have been inoculated, and others put to bed with persons in every stage of the disease; whilst a multitude of the lower order of people have been anxiously intent on bringing the practice into disrepute, and endeavouring, by means the most filthy* and disgraceful, to produce the Small-pox in those who have previously gone through the Vaccine under my inspection.

I shall now proceed to mention a few Cases in particular, to confirm the facts brought forward by Dr. Jenner, not only as to the security afforded against the Small-pox, but also to prove the length of time which the Cow-pox has been discovered (in consequence of that gentleman's enlightened and liberal manner of laying his experiments before the public) to have acted in *this county* with the same influence. I am aware that in bringing forward some of these cases, I shall but repeat what have been already before the public in a pamphlet written by Doctor Pearson, containing "Extract of a letter from me," written two or three years ago; but as they may not be generally known, I shall here repeat one or two instances.

— Rudland, of West Dereham, aged 73, (since dead)
never

* An infant, inoculated twelve months before for the Cow-pox, has been made to eat bread and milk after it has been in the mouth of a boy then labouring under a confluent variolous eruption, and very full about the tongue and fauces. I do not mean to infer, that this would have inoculated the infant if not previously secured by the Cow-pox; but that it was exposed abundantly to the Small-pox effluvia, without sustaining the injury intended.

never had the Small-pox; had been a milker all his life; when a boy, remembered to have had a disease on his hands and fingers, in consequence of the cows being infected with one which at that time was called the Pap Pox; the cicatrices were evident when I saw him last, considerably above fifty years after he had the disease: He was not at all aware of any advantages derived from the accident; but when asked, whether he had had the Small-pox, said No, and supposed he never should; because he had been inoculated so many times. He had not seen the disorder in the cow very often, nor at all for some years, till a month after this conversation, when he sent me word his master's cows were diseased. I went the first opportunity I had, but the pustules had been all broken by the hands of the milkers, and I did not think proper to take any matter from ulcers so occasioned.

A very respectable family in this neighbourhood, originally consisting of three brothers and two sisters, were in the habit of milking more than thirty years ago, contracted a disease from the cows, and suffered so severely from numerous pustules on their hands, and great symptomatic fever from the irritation produced by improper applications to the sores, that they were incapable of any employment, and sent to labourers in the village to milk for them: (one of whom has been before spoken of as having carried the Vaccine matter to the cornea, by rubbing the eye with a diseased finger, and having lost his sight from the opacity occasioned by the cicatrix*.) Of this family, two brothers and a sister are now living within a mile or two of this place, and inform me they have been inoculated with Small-pox virus six or seven times in the course of the last thirty years, but never could have the disease. They had no idea of the reason why they could not, till Dr. Jenner's first publication fell in my way, on which I visited them and obtained the above account. I have since vaccinated two children and two servants in this family, who had the disease properly, and the gentleman was immediately struck with the resemblance of the pustules produced in their arms to those which he had seen occasioned by milking diseased cows.

It would be occupying too much room in your valuable publication to insert more instances of this kind; or I would relate twenty or thirty, in which persons who have had the Cow-pox from ten to fifteen years ago, and have been inoculated with Variolous matter, not having any reason to suppose they were secure by having experienced the other disease.

In

* Vile Dr. Pearson's Pamphlet before alluded to.

In the parish of Denver, adjoining this place, I inoculated one hundred persons of all ages; among which I observed one case of spurious Cow-pox in a maid servant, and one child in whom I could not succeed in giving the disease; probably from the system being at that time affected with the Chicken-pox.—The young woman was inoculated a second time with no better effect; but the mother of the child refused any farther trial. The remaining 98 persons went through the disease in the usual way except one little girl, a daughter of Mr. Beetens, who, a week before, had been exposed to variolous infection, the eruption of which came out in confluent numbers on the seventh day after the introduction of Vaccine matter; (which also took effect, and the arm met with no interruption in its progress from the Variolous disease.) Her sister slept with her the whole time, had an eruption of some hundred pimples, with widely extended inflammatory margins, but all of them disappeared in three or four days without proceeding to maturation. Query, Does this instance throw any light upon those cases of eruption supposed to have been occasioned by the mixture of the two diseases, in consequence of a variolated atmosphere? Fearful that the young woman and child above-mentioned might take the Small-pox, and be the occasion of unmerited prejudice against the new inoculation, I took care to apprise the parents of the other ninety-eight children, of the consequences that would follow, if those two should be exposed to the Variolous infection; at the same time had no hesitation in pronouncing all the others perfectly safe from such a circumstance. In less than three months the maid servant had the Small-pox in a favourable manner, after attending the funeral of an infant who died of it; and the other child, whom I marked out to them as not safe, caught the infection and died, whilst the brother, who slept in the same bed, one of the ninety-eight who had the true Vaccine, remained secure from the fatal scourge, as did all the others who had mixed indiscriminately with the most infectious.

Early in the month of April last I inoculated twenty-two paupers in the parish of Shouldham Thorpe; amongst whom was an old woman, aged 80, who was very desirous of having the Small-pox, as she had two grand-children in the house whose parents would not consent to have them vaccinated. I had no inclination to indulge her prejudice, knowing the difficulty of managing that class of people in respect to diet and cool treatment; particularly as the distance from this place would not allow of my seeing her frequently during the eruptive fever. I therefore determined to inoculate *her* with Cow-pock matter, and the *children* with Variolous. The incisions

all took place, and she went through the usual slight indisposition without confinement, while the children were extremely ill four or five days previous to a favourable eruption. As soon as I found her arm put on the characteristic appearance of Cow-pox, I told her what had been done; when relying on my assurance of her safety, she has ever since expressed herself quite satisfied, as well as the parents of the remaining nineteen children, who were all inoculated with Cow-pock matter, and had the disease in a proper manner. Many persons in the same village were at that time under Small-pox Inoculation, and were under no restraint from mixing with those who were successfully vaccinated.

It may be of consequence to remark, after what length of time persons exposed to natural Small-pox² may safely, and with every hope of intercepting it, be inoculated with Vaccine matter.

In the month of March last, ——— Guyton, a girl about 18, having taken the Small-pox in the natural way, was removed from her service, and conveyed to the parish of Tottenham, to her father's house; there were seven younger children who had never had the disease. I was desired to visit this girl, whose disease was of the confluent kind, on the third day after her removal; and having long wished to ascertain the liberty that might be taken in these instances of exposure to Variolous infection, I inoculated the seven children with fresh Vaccine matter, and fortunately succeeded in every case; and although three* of them did not take place from the first insertion, and were left to be inoculated from those that did, yet they all escaped the Small-pox, and went about their usual employment, which was bird-keeping, or rather scaring, and oat-setting. In these cases, however, I had matter which was *sure* to succeed as far as it would go, or should not have ventured the experiment.

I had never seen an instance of casual Cow Pox on the hand of a dairy maid, till about the middle of March last; when I was sent for to Mr. Spink's, a considerable farmer at Thorpland, four miles from hence, to visit his eldest child, whom I found with a large swelling and painful inflammation situated near the eye. Mr. Goddard, a gentleman who lives with me, had seen the

* Those who did not take the disease at first were not inoculated till the seventh day after; so that ten days had elapsed from their first exposure to the Small-pox. There is but one door of entrance to the cottage, and, though some care was taken to prevent a general association of the family, the mother, who nursed the eldest daughter, continued to dress and attend upon the younger children.

the child the preceding day, and looked upon the case as an accidental inoculation of the Cow Pox; and having had constant proofs of his judgment and abilities, I went with great pleasure to investigate that which I had no doubt had been accurately accounted for by him. The dairy-maid had been desired a week before to apply a plaister to a slight injury just above the eye, occasioned by the child falling against a table. Upon examining her hands, I found several large pustules, all of which had been broken; and were now surrounded with an areola to a considerable extent. The young woman had a week before been much indisposed, complained of swelling and pain in the axilla, and there could be no doubt of her having gone through the disease in question. Upon enquiring how her hands came to be in that state, she said it was from milking; and that the cows were many of them very sore with pustules on their paps of the same appearance. I then procured Mr. Spink's consent to inoculate two younger children, and he as well as Mrs. S——, were much pleased to see similar pustules produced by my lancet on their arms; but I could not, after several attempts, affect the eldest child, who was still suffering with an angry ulcer from the accidental inoculation. I have every reason to suppose Mr. S—— had the Cow Pox at the same time with the servant; he had complained of a stiffness of the arm, and pain from a small wound on the inside of the thumb, exactly at the bending of the first joint; the motion of which prevented the formation of a pustule, or broke it as soon as formed. I have since inoculated him from the youngest child, but failed in three or four attempts: he had had an enlargement of the axillary glands, and slight constitutional derangement. In the same week, being employed to inoculate a child and two servants of Mr. Wright's, of Whittington, near Stock, I had an opportunity of seeing another case of casual Cow Pox in the dairy-maid, who had been very ill, and whose hands exhibited the appearance of genuine Vaccine disease about three weeks after the original application of the matter. The cows here were also diseased; but as I never had an opportunity of seeing them, except just after being milked, the pustules were always broke, and emptied by that operation. Three weeks after this period, some of the cows still being affected, she contracted the disease again, but the pustules were somewhat different from the first case, being not so uniformly circular, more livid, and irregular, and little or no inflammation at their bases; attended, however, with a very severe constitutional illness, with ten or fifteen pimples about the fourth day of the fever, which had no characteristic marks about them; they contained a small quantity of fluid at the apex on the second day, and matured on the third. It is to be observed

at this period, the parish in general was under Small Pox Inoculation, and this young woman, as well as the other servants and child, were not only frequently going into cottages where the Small Pox then existed, but they were all, except the child, inoculated by me, from a variolous subject of their own choosing; which, however, produced no disease, and the inoculated parts were scarcely to be seen at the end of the seventh day. I shall only mention one more case, which I have omitted in its proper place; and which will shew the severe trial I have given the Jennerian Disease. Being applied to, to inoculate a young woman of the name of Isaby, in this neighbourhood, and her child, then at the breast, I employed the usual means with a vaccinated lancet. The disease in the child's arm observed the usual progress, but the mother's did not take effect.—She, secretly rejoiced at my failure, said, "Now, sir, will you give me the Small Pox, and prove that my child is safe?" I answered, I have no objection; but first, let me make all the children under this roof as secure as yours, and you shall be indulged. After three weeks had elapsed, I inoculated this woman with Variolous matter; it produced the usual symptoms, under the accustomed treatment; the eruptive fever was so considerable, as to make her repent her choice; but the eruption was distinct and truly characteristic; during which the child continued at the breast, and slept with its mother, having no opportunity of being nursed elsewhere.

*Metallic Combinations of Muriatic Acid, in its different States.** By R. CHENEVIX, Esq. F. R. S. R. M. I. A.

THE action of hyperoxygenized muriatic acid upon metals; is, as may well be expected, rapid, and without disengagement of gas. It appears to dissolve every metal, not excepting gold and platina. If the metal be presented to the acid at the moment when it is disengaged from the salt, inflammation ensues; and the phenomena of light and heat vary according to the metal; but the salts thus produced are merely muriates. In order to form real hyperoxygenized muriates, it is necessary to take the

* We are favoured by Mr. Chenevix with his Observations and Experiments upon oxygenized and hyperoxygenized Muriatic Acid, and upon some combinations of the Muriatic Acid in its three states; which have been read at the Royal Society, and we have great pleasure in selecting these experiments as highly interesting to chemists and practitioners in general. EDIT.

the metal in its fullest state of oxidizement, and combine it with the acid, either by double decomposition, or by passing a current of oxygenized muriatic acid gas through the oxide suspended in water. The acid is thus separated into muriatic and hyperoxygenized muriatic acid; and, in these states, combines with the metallic oxide. The metallic hyperoxygenized muriates are different, in every respect, from the metallic muriates. Red oxide of iron is dissolved with difficulty. Oxide of copper more easily. Red oxide of lead exhibits the same appearances, during its combination with this acid, as with nitric acid. When nitric acid is poured, even in excess, upon red oxide of lead, only a part of the oxide is dissolved, unless heat be applied; and what remains becomes a blackish brown powder. But if metallic lead be added, in a just proportion, all the red oxide disappears, and none of the brown powder is formed; neither is there any disengagement of nitrous gas when the metallic lead is dissolved. The precipitates caused in either case, by pouring an alkali into the nitric solution, are yellow. Hence it appears, that red oxide of lead contains too much oxygen to be dissolved by nitric acid. One part of the oxide takes up the excess of oxygen, and becomes brown; while the portion which loses oxygen, becomes yellow, and is soluble in nitric acid. The presence of metallic lead promotes the total solution of the red oxide, by taking up the superabundant oxygen. I found that a current of oxygenized muriatic acid gas, like the nitric acid, dissolved a part of the red oxide, and caused the brown powder to be formed, upon which it could not act. Hyperoxygenized muriate of lead is much more soluble than muriate of lead; and the acid is very slightly attracted by the basis.

But, of all the metallic salts formed by the combination of the muriatic acid, in any of its different states, none so much deserve attention as those which have for their bases the oxides of mercury. The nature of the salts which result from the combination of common muriatic acid with the different oxides of this metal, has been stated in the most contradictory manner by different chemists. But as the knowledge of hyperoxygenized muriatic acid has thrown some light upon the true state of calomel and corrosive sublimate,* I must beg leave to dwell
at

* I regret very much, that I am under the necessity of using these unmeaning terms. But the French Nomenclature has made no distinction between salts formed by metallic oxides, in different states of oxidizement, except by the colour, which is an extremely defective and unmeaning method. At all events, this metal is so uncomplaisant as to retain the white colour, in its different oxides combined with muriatic acid. I prefer, however, using the old name, to proposing any provisional substitute that might be found defective.

at some length upon this important part of my subject. It would be useless to repeat the opinions of the old authors, who have treated of corrosive sublimate, and of calomel. They are to be found in the works of those respective chemists, and I must refer to them for particulars.

In the Memoirs of the Academy of Sciences of Paris, for 1780, we find a paper of Mr. Berthollet, upon the causticity of metallic salts; in which he appears to think, that the acid in corrosive sublimate is in the state of what was then called dephlogisticated marine acid. In 1785, when he had examined the oxygenized muriatic acid with more care, he renounced his former opinion; and gave the reasons why he no longer adhered to it. Some late experiments of Mr. Proust shew, that this chemist thinks as Mr. Berthollet now does. And these may be ranked among the first of modern authorities.

Notwithstanding those opinions, Mr. Fourcroy, in his *Système des Connoissances Chimiques*, still considers corrosive sublimate as a hyperoxygenized muriate of mercury, and designs it throughout by that name. This chemist, one of the founders of the methodical Nomenclature, is too well acquainted with its principles, to apply the term hyperoxygenized muriate to any thing but a combination of hyperoxygenized muriatic acid. It is evident, therefore, that he considers the portion of oxygen, which, in equal quantities of corrosive sublimate and calomel, is greater in the former, to be combined with the acid, and not with the oxide of mercury. As soon as I have stated some experiments that prove Mr. Fourcroy's opinion to be erroneous, and endeavoured to establish the analysis of corrosive sublimate and of calomel, I shall take notice of a salt hitherto unknown, which really is hyperoxygenized muriate of mercury.

I took a portion of corrosive sublimate, and precipitated by potash. The liquor was filtered; and, upon being tried, nothing but muriate of potash was found. No reagent could discover the smallest trace of hyperoxygenized muriatic acid.

Sulphuric, nitric, phosphoric, and many other acids, poured upon corrosive sublimate, did not disengage either muriatic or hyperoxygenized muriatic acid. Nitrate of silver, poured into a solution of corrosive sublimate, gave an abundant white precipitate.

From these experiments it is evident, that muriatic acid, not hyperoxygenized muriatic acid, is combined with the oxide of mercury in corrosive sublimate.

To determine the proportions of this salt, I took one hundred parts, and precipitated by nitrate of silver. I then took another hundred, and precipitated by potash. The result of
these

these two experiments was such as to establish the proportions of corrosive sublimate as follows :

Oxide of mercury	—	—	—	—	82
Muriatic acid	—	—	—	—	18
					<hr/>
					100.

But the acid of this salt not being charged with a superabundance of oxygen, we must look for the excess in the metallic oxide. I took 100 grains of mercury, and dissolved them in nitric acid; then poured in muriatic acid; and, at a very gentle heat, evaporated to dryness. I afterwards sublimed, in a Florence flask, the salt that remained, and obtained 143,5 of corrosive sublimate. But 143,5 of corrosive sublimate contain 26 of acid, which will leave 117,5 for the mercurial oxide; and, if 117,5 contain 100 of mercury, 100 of the oxide will contain 85. Therefore, the oxide of mercury, in corrosive sublimate, is oxidized at the rate of 15 per cent.

To determine the proportions in calomel, I dissolved 100 grains of it in nitric acid. The phenomena of the solution have been so accurately described by Mr. Berthollet, that I shall not repeat them. I precipitated by nitrate of silver, and obtained a quantity of muriate of silver, corresponding with 11,5 of muriatic acid. The oxide of mercury I obtained apart. Therefore, calomel is composed of,

Oxide of mercury	—	—	—	88,5
Muriatic acid	—	—	—	11,5
				<hr/>
				100,0.

To ascertain the state of oxidizement of the oxide in calomel, I took 100 grains, and boiled them with nitro-muriatic acid; then evaporated very slowly, and sublimed as above. The calomel was totally converted into corrosive sublimate, and weighed 113. But 113 of corrosive sublimate contain 20,3 of muriatic acid, of which, 11,5 were originally in the calomel. The total addition of weight was 13. But the quantity of acid in these 13, amounts to $20,3 - 11,5 = 8,8$. Therefore, $13 - 8,8 = 4,2$, remain for that part of the additional weight which is oxygen. On the other hand, 100 of calomel contain the same quantity of mercury as 113 of corrosive sublimate, = 79. These 79, with 11,5 of acid, are equal to 90,5, and leave 9,5 for the quantity of oxygen contained in calomel. It would appear, from these experiments, that corrosive sublimate contains 6,5 per cent. more acid, and but 2,8 per cent. more oxygen, than calomel. But this quantity of oxygen is combined with a much greater proportion of mercury; and forms an oxide of a very different

different degree of oxidizement. For, $88,5 : 9,5 :: 100 : 10,7$. Therefore we may establish the following comparative table.

CALOMEL.				CORROSIVE SUBLIMATE.			
The oxide of mercury in calomel is composed of,				The oxide of mercury in corrosive sublimate is composed of,			
Mercury	—	—	89,3	Mercury	—	—	85
Oxygen	—	—	10,7	Oxygen	—	—	15
			<hr/> 100,0.				<hr/> 100.
And calomel is composed of,				And corrosive sublimate is composed of,			
Mercury	79	{ oxide of }	88,5	Mercury	69,7	{ oxide of }	82
Oxygen	9,5	{ mercury }		Oxygen	12,3	{ mercury }	
Muriatic acid	—		11,5	Muriatic acid	—		18
			<hr/> 100,0.				<hr/> 100.

These proportions are different from those given by Lemery, Geoffroy, Bergman, &c. But, without calling in question the accuracy and skill of these chemists, it is fair to assert, that the pure materials used by modern chemists, are more likely to lead to sure results, than the impure reagents of the ancients.

In these salts we find another instance, that, in proportion as metallic oxides contain a greater quantity of oxygen, they require a greater quantity of acid to enter into combination with them.

The method I have followed, to ascertain the proportions just stated, may appear, at first view, not to be the shortest that I might have adopted. But I have tried others, and have found none so accurate. It is impossible, synthetically, to convert a given quantity of mercury into calomel, in such a manner as to be certain that none of it is in a different state from that required. And, if we would attack calomel analytically, the action of the alkalis, without which we cannot proceed, is such as to alter the nature of the oxides. I have also made many comparative experiments, by dissolving calomel in nitro-muriatic acid, (which converted it into corrosive sublimate) and then precipitating by ammonia; but I have not found these trials so successful as those I have described. The nature of the precipitate from corrosive sublimate by ammonia, certainly differs, according to the excess of acid that may be present; and mercury seems to have the power of existing in many degrees of combination with oxygen. The only precaution absolutely necessary in this mode of operating, is, that while the mercurial salt is in an open vessel, it should not be exposed to a degree of heat capable of volatilizing any part of it.

The

The quantity of mercury ordered in the London Pharmacopoeia, to convert corrosive sublimate into calomel, is 9 pounds of mercury for every 12 pounds of corrosive sublimate. But, from the above experiments, it would appear, that a smaller quantity of mercury might strictly answer. However, from the results of minute investigation, we should not conclude too hastily upon preparations on the great scale; and I rather think, that the excess of mercury ordered by the Pharmacopoeia is a useful precaution.

In my experiments, I attempted to reduce, by means of copper, iron, or zinc, the mercury contained in the mercurial salts. Iron did not answer the purpose; zinc precipitated the mercury a little better; and copper produced a change which I did not expect. If a bit of copper be put into a solution of corrosive sublimate, a white powder shortly falls to the bottom; and that powder is calomel. When washed, it does not contain an atom of copper, nor of corrosive sublimate.

Before I conclude these considerations, I must say, that whether calomel be prepared in the dry or in the humid way,* it does not seem to differ chemically; nor does it contain any sensible

* By the humid way, I do not mean precisely the method of Scheele. That chemist desires us to boil the acid with the mercury, after they have ceased to act upon each other at a low temperature. By this method, the nitric acid takes up an excess of mercurial oxide; and the nitrate of mercury thus formed, precipitates by water. Therefore, when this nitrate of mercury is poured into the dilute solution of muriate of soda, according to the formula of Scheele, the action, on the part of the solution, is twofold.

1st. The water acts upon one part, and precipitates an oxide, or rather an insoluble subnitrate of mercury. And,

2dly, A double decomposition takes place between the nitrate of mercury and the muriate of soda. It is with reason that the medical world have supposed the calomel of Scheele to be different from that prepared in the humid way; for it is, in fact, calomel, plus an insoluble subnitrate of mercury. In the first part of Scheele's process, there is disengagement of nitrous gas, together with oxidizement and solution of some of the mercury. When he boils the acid upon the remaining mercury, there is no further disengagement of gas; yet more mercury is dissolved. The nitrate of mercury, therefore, rather contains an oxide less oxidized after ebullition than before it. The true difference is in the subnitrate of mercury, precipitated, as I before said, by the water in which the muriate of soda was dissolved. And the orange coloured powder, which remains after an attempt to sublime Scheele's calomel, is to be attributed to the same cause. To prepare calomel in the humid way, uniform as to itself, and in all respects similar to that prepared in the dry way, it is necessary, either to use the nitric solution before it is boiled, or to pour some muriatic acid into the solution of muriate of soda, previously to mixing it with the boiled solution of nitrate of mercury. In the first case, no precaution is necessary; and, in the latter, the oxide of mercury, which the nitrate of mercury has, by boiling, taken up in excess, finds an acid which

sensible portion of water of crystallization. The same may be said of corrosive sublimate.

It now remains to speak of the real hyperoxygenized muriate of mercury. I passed a current of oxygenized muriatic acid gas through some water, in which there was red oxide of mercury. † After a short time, the oxide became of a very dark brown colour; and a solution appeared to have taken place. The current was continued for some time; and when I thought that a sufficient quantity of the oxide had been dissolved, I stopped the operation. The liquor was evaporated to dryness; and the salt was thus obtained. There evidently was in the mass a great proportion of corrosive sublimate, as might be expected, from what I had observed to take place in the formation of the other salts of this acid; but, by carefully separating the last formed crystals, I could pick out some hyperoxygenized muriate of mercury. I then crystallized it over again; and, in this manner, I obtained it nearly pure. This salt is more soluble than corrosive sublimate: about four parts of water retain it in solution. The shape of its crystals, I cannot well determine. When sulphuric, or even weaker acids, are poured upon it, it gives out the usual smell of hyperoxygenized muriatic acid; and the liquor becomes of an orange colour. This is a sufficient proof, that corrosive sublimate is not a hyperoxygenized muriate of mercury.

I have just mentioned, that in the formation of this salt, the oxide of mercury, which was not dissolved by the acid, became of a very dark brown colour. I procured a portion of this oxide, which seemed different from the red oxide. It however retained the form, and the crystalline appearance, of the latter. It was soluble in nitric acid, without disengagement of gas; and was precipitated from it, in a yellow oxide, by all the alkalis, except ammonia. It formed corrosive sublimate with muriatic acid; and the precipitate by the alkalis was the same as that from corrosive sublimate, made with the red oxide. Yet I am inclined to think, that the dark brown oxide differs in some essential point from the red; but I have not yet made sufficient experiments to prove this opinion. At all events, the present object being to examine the mercurial oxides only as combined with muriatic acid, it would be foreign to the purpose,

which is ready to saturate it. All the mercurial oxide being thus converted into calomel, none of that subnitrate of mercury can be present.

The objections made by a Medical gentleman against Scheele's calomel, when this Paper was read before the Royal Society, led me to reconsider the subject, and to undertake the investigation detailed in this Note.

† I used either of the red oxides of mercury, indiscriminately.

To Dr. BRADLEY.

DEAR SIR,

HAVING been frequently disappointed in attempts to extract balls, and exfoliated pieces of bone, by the forceps in common use, I was induced to attempt an improvement in the construction of these instruments, and requested Mr. Stodart to make several pairs on a different plan, which you will find represented in the drawing I have enclosed, and which has been found perfectly to answer its intention.

The old ball forceps (see fig. 1.) are faulty in several respects. 1st. The principal length of the instrument is thrown into the blade instead of the handle, which is in consequence too short, and renders the gripe weak and uncertain. 2. The two parts of the handle touch each other when the instrument is shut; and very much limits its power. 3. The rings of the handle cramp the fingers, to which only they are adapted, for they make it impossible to hold the instrument firmly in the palm of the hand. From these causes, if a ball, or other extraneous substance, be fast driven into any part, the forceps perpetually slip from it, and it becomes extremely difficult to dislodge and bring it away.

The new forceps, (see fig. 2.) remedy all these inconveniences. 1. Their principal length is thrown into the handle, which adds very much to the power of the instrument, and consequently to the firmness with which it will hold any substance which it is necessary to extract. 2. The two parts of the handle are divergent, somewhat broad and roughened, and made without rings, so that they can be held by the whole hand, and used with a much greater purchase. By this mode of constructing the instrument more metal also can be employed, so as to render it more solid, capable of being harder tempered, and thus of course, much stronger than the other, without being inconvenient from its bulk.

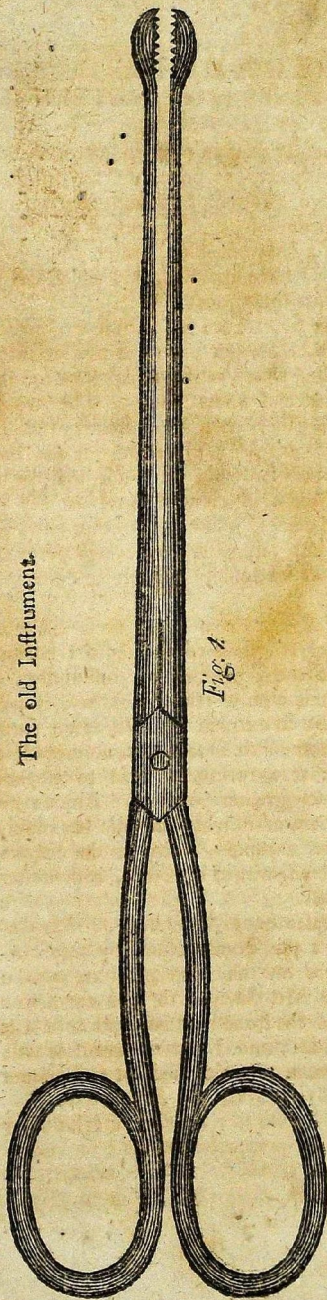
The army instrument cases have lately been furnished with straight and curved forceps of this construction, by order of the Surgeon General. Forceps on the same plan are also now made by Mr. Stodart and Mr. Savigny for the extraction of exfoliated bones, polypi, of the stone in the operation of Lithotomy, and for other purposes; and I flatter myself it will be found a considerable improvement in this class of instruments.

South Audley Street,
May 15, 1802.

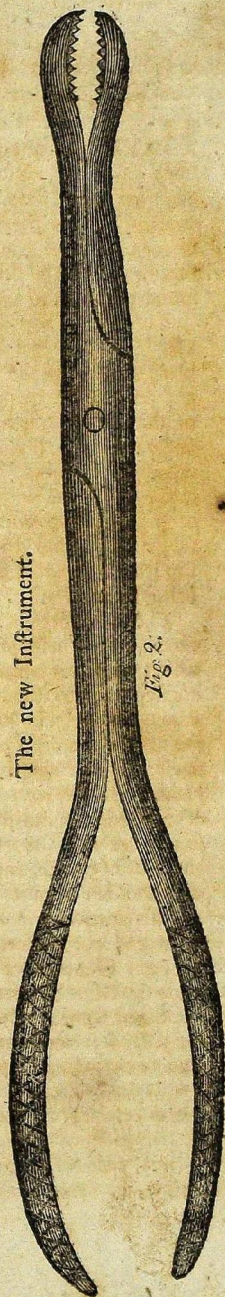
I am, &c.

T. CHEVALIER.

The old Instrument.



The new Instrument.



ACCOUNT OF DISEASES IN AN EASTERN DISTRICT OF LONDON,

From April 20, to May 20, 1802.

ACUTE DISEASES.			
Typhus	- - - - - 3	Gastrodynia	- - - - - 5
Catarrh	- - - - - 12	Enterodynia	- - - - - 4
Pneumonia	- - - - - 7	Hæmorrhoids	- - - - - 6
Rheumatismus Acutus	- - - - - 5	Dysuria	- - - - - 4
CHRONIC DISEASES.		Calculus	- - - - - 1
Tussis	- - - - - 17	Scrophula	- - - - - 7
Dyspnœa	- - - - - 18	Itch	- - - - - 3
Tussis cum Dyspnœa	- - - - - 25	Herpes	- - - - - 6
Phthisis Pulmonalis	- - - - - 5	Rheumatismus Chronicus	- 20
Raucedo	- - - - - 3	PUERPERAL DISEASES.	
Hydrothorax	- - - - - 2	Menorrhagia Lochialis	- - - 3
Ascites	- - - - - 2	Mastodynia	- - - - - 4
Anasarca	- - - - - 4	Enuresis	- - - - - 2
Cephalalgia	- - - - - 6	INFANTILE DISEASES.	
Apoplexia	- - - - - 1	Pertussis	- - - - - 9
Paralysis	- - - - - 3	Rubeola	- - - - - 7
Epilepsia	- - - - - 1	Scrophula	- - - - - 5
Syncope	- - - - - 2	Herpes	- - - - - 3
		Tabes	- - - - - 2

The degree of cold which has prevailed during the period that has passed since our last Report, has been uncommonly severe; it is reported that, in some parts of the country, it has been greater than can be recollected to have existed at the same season of the year. The effects of this have been severely felt amongst the vegetable tribes; many of the early crops appearing in our gardens a few weeks ago, and which were in a very healthy and flourishing state, are entirely destroyed. Its effects have also been felt in the human frame. Many of the diseases which commonly retire at this season of the year, have either been protracted beyond the usual period, or have returned with increased violence. A large number of cases of catarrh, dyspnœa, cough, and rheumatism have occurred. The pretty constant appearance of sun-shine, and the pleasant temperature which was felt when screened from the north and north-east winds, encouraged invalids to venture abroad without sufficient clothing to defend them from the influence of these winds; and the consequence has been, a renewal of those complaints from which they were gradually recovering.

The diseases of children still prevail; measles and whooping cough continue to form a large proportion of the disorders to which this class of patients is liable. In some cases, those complaints, or their consequences, have probably been aggravated

vated by a removal to different situations, with a view to change the air, in which they have been more exposed to the cold winds which have been blowing for some time, and the effects of which they have felt in a severer degree.

Observations on Vegetable Anatomy, by Cit. MIRBEL.

(Extracted from a Memoir presented to the National Institute.)

ALL vegetables are composed of a membranous texture, the form and consistency of which varies not only in the different species, but also in the same individual. There are no true fibres to be found in vegetables, the filaments to which that appellation has been assigned, being nothing but membranes, detached in small longitudinal slips. The membranous texture, though closely coherent in all its parts, forms two species of different organs, viz. the cellular texture and the tubulous texture. The cellular texture consists of a membrane, in the duplications of which interstices, contiguous to one another, are hid, which when not compressed have an hexagonal figure, but by any pressure from either side they receive the form of a parallelogram. The membranes of these cells are perforated with small pores, through which the juices are to pass. The exterior side of these cells is formed by the epidermis, which thus considered is not to be taken for a particular membrane. The cellular texture occurs in the fleshy parts of plants, in the succulent fruits, the bark, the embryo, &c. The tubulous texture comprises two kinds of tubes, the large ones and the small ones. The large tubes are found in the cellular texture and occupy the centre of the ligneous part in the monocotyledones, and are sometimes spread without order in the wood of the diatyledones; sometimes however they are distributed in regular groupes and arranged in concentrical zones; they never occur in fungusses, lichens, and fucusses. We may distinguish four species of large tubes. 1. The *simple* tubes, the sides of which are without pores; they contain the succi proprii of plants, and are particularly numerous in the bark. 2. The *porous* tubes. Their sides are perforated like a sieve with many pores, which are arranged in regular and parallel rows; their use seems to be the same as in the first tubes. 3. The *false tracheæ*, (*fausses trachées*) are tubes transversally intersected with parallel openings or porous tubes, in which the pores are larger than in the preceding species: They are mostly found in wood that is not very hard, but particularly in the monocotyledones. 4. The *tra-*

cheæ,

cheæ. These are tubes composed of threads or filaments, which are turned in spiral lines from the right to the left. They are observed in all the soft parts of vegetables. The trachea of the butomus umbellatus, when once unfolded, do not contract again. The distinction of these four species of tubes, however, is by no means so exact as to admit no exception; thus the butomus offers, in the same tube, the pores of the porous tubes, the openings of the false trachea, and the spiral windings of the true trachea. These tubes Cit. Mirbel distinguishes by the name of *tubes mixt.*

The small tubes are composed of cells united with one another, which are closed at their extremities; their walls are frequently provided with pores; in the embryo they are not yet evolved. We may observe them in some lichens. Placed round the large tubes they make the ligneous filaments in the monocotyledones; and in the dicotyledones, being arranged round the marrow and the large tubes, they compose the ligneous strata. They frequently fill and obstruct the large tubes. Cit. Mirbel gives the name of *lacunae* (lacunes) to regular and symmetrical interstices, which are formed in the interior of vegetables by the dilaceration of the membranes, a phenomenon which is particularly observed in plants of a lax texture. In the horsetail (*equisetum*), they are of an extraordinary regularity; one being larger than the rest, forms a tube in the centre of the stalks, while two rows of small ones surround the central tube; in the leaves of the monocotyledones the lacunae are intersected with partitions visible to the naked eye, consisting of cellular substances. It is probable the large tubes originate from the lacunae. Though there are no glands to be perceived in vegetables, they may be supposed to exist in the membranes, as sap is secreted and elaborated in them. It is not improbable, the opacous wreaths that surround the pores and the orifices of the large tubes, are of a glandulous nature. The pores are small openings in the membranes, of which three species may be distinguished:—1. The *insensible* pores, which cannot be perceived, but seem to be the organs of the insensible transpiration. 2. The *elongated* pores, or the organs described by Decandolle, by the name of cortical pores, each of which corresponds to a cell; they serve for the transpiration and absorption of fluids; their seat is the epidermis of the herbaceous part. 3. The *glandulous* pores; these are openings surrounded with opacous irregular wreaths; they occupy the interior, and sometimes the exterior, parts of plants. They are either very minute, or larger, in which case they seem to be formed by the union of the smaller ones.—All parts of vegetables are originally mucilaginous; thus the embryo is, at the first sight, nothing

thing but a mucilage, very similar to the white of an egg. This mucilage is remaining at the interior bark (albumen), and at the medulla in the dicotyledones, and it is placed round the ligneous filaments in the monocotyledones. The cellular as well as the tubulous texture seem to originate from this mucilage. The embryo adheres to the mother plant by means of an umbilical cord, which has a peculiar organisation. In this manner Cit. Mirbel endeavours to explain the vegetable organisation, but he observes, at the same time, how comparatively inconsiderable the progresses are which we have hitherto made in the knowledge of the vegetable organisation.

Criticisms on the Treatment of the Venereal Disease.

By T. VAGE, M.D. F.R.S.

[Continued from Vol. III. p. 465 — 471.]

AGREEABLY to promise, in a former Paper upon the local and recent symptoms of the Venereal Disease, I now send you a few Remarks upon the confirmed state of it, and upon the infirmities of constitution which frequently remain after its cure. In stepping forward on subjects which have already undergone the disquisitions of men of the first abilities, I can only observe, that a very extensive experience in military hospitals for many years, has clearly evinced that the usual modes of treatment, in these respects, still continue very defective. But while that experience shewed the insufficiency of practice, it was considered, at the same time, to afford ample opportunities of improvement, by admitting of rational deviations; and the results of a multiplicity of trials in such cases, as far as they were found useful, are here submitted to your consideration. From the several ingenious theories and sedulous researches of many eminent practitioners to advance medical knowledge, in this and other disorders, and which at present emulously engage their attention, we may expect much information; in the mean time, a little practically ascertained may probably be acceptable.

The absorption of the venereal virus into the circulation, which may be termed its secondary infection, generally contaminates the habit to an extensive degree before it shews any signs of its presence; and hence, when it does appear, its symptoms are far more severe and obstinate than those of its incipient infection, although they arise from similar sources,
from

from the inflammation and ulceration of the solids. It is a singular circumstance of the venereal poison, that such a deprivation of the fluids as it here produces can exist for a length of time, without disturbing the constitution in any remarkable degree. Some parts of the system appear more susceptible of the infection than others, as the glands, membranes, bones, periosteum, cartilages, &c. and hence nocturnal pains in various parts of the body, violent head-achs, defecations and ulcerations of the skin, and the like.* As this disease has, naturally, no limits to its progress, it invades by degrees all the functions of the animal economy, imitating a variety of other complaints, as asthma, phthisis, paralysis, dyspepsia, hypochondriasis, &c. until at length, after a series of the most excruciating torments, the whole frame perishes under its ravages, the most ghastly spectacle of human wretchedness.

The venereal infection would appear to be at first communicated in different degrees of virulence. In some it is only a slight gonorrhœa, with scarce any inflammation; in others, it attacks the parts with which it comes in contact at once with ulceration, as chancres and severe urethral corrosions; and in proportion to this first mildness or acrimony, when it gets into the habit, it is slower or speedier in the production of its secondary symptoms. I have met with several cases of confirmed lues, which required some years to become so, where the incipient infection was slight; while it is common to see the symptoms of a general contamination in the space of a few months from that degree of virulence which produces chancre. It has been already observed, contrary to the opinions of some, that the sooner the recent or local ulcerations are cured, the better, on account of the absorption of the infectious matter, which in all cases, in some degree or other, takes place; yet it must be further observed, that nothing is more deceitful than a speedy cure of all venereal sores, although so necessary; as it is apt to prompt to a hasty conclusion, that every thing is accomplished, and which I am sorry to say, seems frequent with many practitioners, to acquire the repute of expertness. The cessation, therefore, of all venereal appearances, should be followed for some time with the correcting alteratives.

The infectious particles themselves perhaps suffer no change, and only become more or less virulent in being more or less concentrated. For certainly, the more numerous the points of infection are in any part, the greater the corrosion will be.
And

* Several parts which Haller supposes destitute of sensation, become exquisitely sensible in a state of inflammation.

And what particularly accelerates that corrosion, is, that the infectious matter is generated by the corruption, and not saturated like the phlegmonic acrimony of some abscesses. The external mode of action of the venereal poison explicitly teaches us its internal operations; but all its internal attacks may be regarded as so many sources, which propagate the infection more effectually, in being removed from inspection, and the direct application of remedy. Another thing that frequently promotes the progress of the disease, is a neglect of its symptoms, from the patient's ignorance of their nature and presence, so that a considerable time elapses before any application is made for relief. But should the first symptoms be attended to, they ought not to be rated according to any apparent mildness, but from the importance of the parts attacked; for should these parts be essentially necessary to health, or contiguous to some which are so, a very little time may render the inflammation and ulceration extremely dangerous, as the virus is unremitting and speedy in its effects.

Great improvements in the treatment of recent infection, have been made within a few years of the last century; sorry am I to observe, that the endeavours of many eminent men have not been attended with similar success in the confirmed stages of it. The warm controversy concerning some new discoveries which still subsists between several gentlemen of much ingenuity, experience, and respectability, can afford but little assistance to those practitioners, who with prudence and safety conduct themselves by established precepts. Mercury is the only remedy as yet admitted by all as a specific for this disease; and yet in the most judicious use of it, disadvantages it has sufficiently momentous to warrant further researches, either for the prevention of its detriment to the habit, or for other specifics with less injurious properties. Among what are termed new discoveries, the nitric acid seems to claim the chief regard; for although it is not adequate to a perfect cure in confirmed cases, yet if given at proper intervals it very much prevents some of the ill effects of mercury, particularly upon the teeth and gums, and the debility of the digestive viscera. From these properties of the acid, it was reasonable to suppose that the mineral in combination with it, would improve in its medicinal efficacy; and from many trials of it as an alterative, I have had the satisfaction to find my expectations answered, not only in venereal complaints, but in scrofulous and cancerous cases also.

How far the substances by which mercury is divided, pass with it into the system, would seem a curious and perhaps a useful inquiry. It is capable in its simple state, however, when minutely divided, of mixing with the fluids, and of pervading the

remotest recesses of the system. But as it is a substance incapable of assimilation, it must of course return from thence, to be evacuated from the habit by such channels as are appointed to separate the recrementitious parts of the circulation. The curative efficacy of mercury in venereal complaints, evidently arises from the correction of syphilitic virus, whether it appears in the inflammation or ulceration of the solid parts, or in the iniquination of the fluids. The infectious matter propagates itself by the corruption, or, in other words, by changing the parts which it attacks into its own nature. Hence it is that the smallest speck or particle of infection in any part, becomes rapidly progressive, even though there should be no general taint in the habit, nor any of the original infection remaining. Nothing, therefore, can arrest the progress of the disease but a change in the infectious acrimony; wherever it may exist; and there seems no other rational mode of effecting this but upon the principle of attractive affinity or combination, by which it is well known that substances lose their original qualities, and for which mercury, by a minute division, and its general disposition to unite with other substances, is well adapted. That mercury is capable of acting in this manner, is further evident from its power of reducing some foul ulcers to a good complexion, whose acrimony is locally generated, and which would otherwise continue to be erosive. As the mineral, then, cannot itself remain in the habit, it must consequently carry with it the infectious matter, in combination, and thus rendered inert, to be evacuated by some of the emunctorial outlets. The internal inflamed and ulcerated parts, thus liberated from the corrosive matter, will, like external ones, assume a healing condition, if the solids are not much impaired, or the humours not much impoverished.

This brings me to observe, that in courses of mercury, which are requisite for the cure of confirmed lues, nothing claims more attention than the support of the digestive viscera, because a nutritious chylickation is absolutely necessary to enable Nature to repair the damages of ulcerated parts, while remedies correct the acrimony; and especially as mercury has a direct tendency to debilitate these organs. For it is very observable, that even a common fore will put on a bad complexion, merely from poor living, or a dyspeptic habit. This precept so necessary, is however so little regarded, that it is no uncommon thing to see ulcers remain unhealed, after a strict exhibition of mercury, and after the infection has been completely subdued. In whatever way then the mercury is used, it will be found of the utmost benefit to give stomachic corroborating bitters at proper intervals. It is upon this principle, perhaps,
that

that modern practice prefers the introduction of the specific by inunction. But, with full assent to this, I would still advise some gentle use of it internally; especially as it can be done with safety, in the most delicate constitutions, under the caution just mentioned. For in a general contamination of the habit, the glands, as before remarked, are particularly subject to the infection, and, of course, the glands of the mesentery, through which the lacteals pass, cannot well escape, and which, in such a case, must vitiate the chyle. To compensate for this, these glands are doubly within the power of remedy; first in the general method of cure, and still more directly by the conveyance of the lacteals themselves.

Under these precautionary ideas the habit must be kept replete with the specific, until the disease is perfectly eradicated. This will require, at proper intervals, a repetition of inunction, or of whatever mode of using it may be adopted. For part of the remedy, which has pervaded the constitution is constantly passing off through the emunctorial passages. And here it requires some address to prevent the mercury, in such a degree of it, from discharging itself by salivation, which, from some failures of cure in my own practice, and from that of some of the ablest practitioners, there is much reason to suppose this evacuation uncertain, and in some cases inadequate to the purpose. Any forced evacuation indeed prevents the remedy from pervading the system sufficiently. A common cathartic, we see, produces this effect, and even diverts its natural tendency to the salival glands. Besides these objections, such a constant flux of humours to the head frequently injures the brain and origin of the nerves so much, as greatly conduces to that debility of habit which often remains after cure, and which is always difficult to remove. These and other reasons of the same nature it was which probably induced some to adopt, at first, an alterative plan of treatment; but the modes which are generally adopted for this end, are not less objectionable than the former. Some give alterative doses of the specific, indeed, but subjoin cathartics at stated times, which most certainly counteract the salutary effects of the mercury. Others employ it in like manner, but without any regard to confinement or regimen, in consequence of which the remedy is either turned upon the bowels, and frustrates the intention as much as if a cathartic was annexed to it; or else produces a spitting, which requires cathartics to suppress; while others, again, unite the mercury with laxatives, which keep up nearly a continual diarrhoea. Mercury, therefore, can only act its part properly when it disturbs no function, and produces, or is accompanied with, no sensible or copious evacuation; and the only outlet for this is

through the cuticular pores. Every point of the whole surface of the body is here employed for the purpose; so that an equal quantity, or more, may be discharged this way than by any other emunctory, without any inconvenience. But the chief advantage is, that the remedy is never discharged this way, until it has pervaded the habit, and consequently exerted its antivenereal qualities with proper extent and effect. And, indeed, the cuticular pores, upon another account, would appear the most eligible for this purpose, as they are the mode of evacuation which Nature generally appoints for the morbid matter in other diseases. But the proper management of this business, it must be confessed, requires as much care, method, and regularity as salivation itself; the same confinement, warm clothing, particularly the use of flannel; yet it will make ample amends for these inconveniences in its certainty of success, in its being less hurtful to the constitution, and generally in requiring less time.

[To be continued.]

CRITICAL RETROSPECT

OF

MEDICAL AND PHYSICAL LITERATURE.

1. *THESAURUS MEDICAMINUM: or a new Collection of Medical Prescriptions, distributed into twelve Classes, and accompanied with Pharmaceutical and Practical Remarks, exhibiting a View of the present State of the Materia Medica and Practice of Physic, both at home and abroad.* 2d. Edit. By a Member of the London College of Physicians. 8vo. pp. 412. London. Baldwin, 1794.

THIS first volume, though published so long ago, is noticed at present for the sake of introducing the second, which is just published. The twelve classes into which the *Materia Medica* is here distributed, are, 1. Evacuants, viz. Errhines, Sialagogues, Expectorants, Emetics, Cathartics, Diuretics, Diaphoretics, and Emmenagogues. 2. Emollients, viz. Relaxants, Diluents, and Demulcents. 3. Absorbents. 4. Refrigerants. 5. Antiseptics. 6. Astringents. 7. Tonics. 8. Stimulants. 9. Antispasmodics. 10. Narcotics. 11. Anthelmintics. 12. Heteroclites.

The public opinion respecting this volume, is sufficiently declared by its extensive sale; and therefore, we shall proceed to the present continuation.

2. *A Prac-*

2. *A Practical Synopsis of the MATERIA MEDICA*, Vol. 2d. Part. I. containing Six of the Classes, viz. 2. Emollients. 3. Absorbents. 4. Refrigerants. 5. Antiseptics. 6. Astringents. 7. Tonics. By the Author of the *THESAURUS MEDICAMINUM*. 8vo. pp. 149. London, 1802: Baldwin, Seely, &c.

The author informs the public, that the second part of this volume, which will complete the work, is preparing for the press, and will be published in the course of the ensuing winter.

In an advertisement, he says, "Since the publication of the first volume of this work, eight years have elapsed. The author will not detain the reader with explaining the causes of this interruption; but will rather assign the reasons why he has thus sent forth a part only of the second volume, without waiting until the whole should be ready for the press. He has been induced so to do by the consideration, that if he had withheld this part longer, he should have heightened the displeasure already incurred with the purchasers of the first volume. If his other engagements have prevented him from bringing the work to a conclusion now, one advantage will result from it; viz. more opportunity will be allowed for investigating and determining the powers and uses of some new and not yet fully tried remedies, belonging to the important Classes of Antispasmodics and Narcotics. These, with the Classes of Stimulants, Anthelmintics, and Heteroclitics, together with some supplementary pages relative to the necessity of altering and amending the *Materia Medica* conformably to the progress and improvements in Natural History, Chemistry, Physiology and Clinical Practice,—showing that this branch of medical knowledge is capable of being raised to a pitch of consideration far above that which it has hitherto attained—will make up the remaining part of this volume.

"As some persons may be dissatisfied with the suppression of the Author's name, he wishes it to be understood that it is his intention to affix it to the concluding part of the work."

To each Class is prefixed a tabular view of its contents, including food as well as medicines, and arranged according to the three kingdoms of Nature.

As a specimen, we shall take the fifth Class, *Antiseptics*.

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| " (1.) <i>From the Animal Kingdom.</i> | |
| <i>Ammonia acetata.</i> Acetated Ammonia. Water of Acetated Ammonia. | <i>Acetum camphoratum.</i> Camphorated vinegar. |
| <i>Ammonia muriata.</i> Muriated Ammonia. Salt Ammoniac. | <i>Acetum nitrosum.</i> Nitrous vinegar. |
| | <i>Anthemi snobilis.</i> Chamomile. |
| | <i>Aristolochia Serpentina.</i> Virginia Snake-root. |
| " (2.) <i>From the Vegetable Kingdom.</i> | <i>Arnica montana.</i> Leopard's bane. |
| <i>Acetum distillatum.</i> Distilled Vinegar. | <i>Artemisia Abrotanum.</i> Southernwood. |
| <i>Acetum aromaticum.</i> Aromatic vinegar. | <i>Artemisia Absinthium.</i> Common Wormwood. |

Artemisia

<i>Artemisia maritima.</i> Sea Worm-wood.	<i>Fermentum cerevisiæ.</i> Yeast.
<i>Cinchona officinalis.</i> Peruvian Bark.	<i>Cerevisia.</i> Malt liquor.
<i>Citrus medica.</i> The Lemon.	<i>Vinum.</i> Wine.
<i>Conium maculatum.</i> Hemlock.	<i>Spiritus vini.</i> Spirit of Wine
<i>Daucus Carota.</i> The Carrot.	“ (3.) From the Mineral Kingdom.
<i>Dorstenia Contrayerva.</i> Contrayerva.	<i>Aqua frigida.</i> Cold Water.
<i>Hordeum vulgare.</i> Barley. Malt.	<i>Acidum muriaticum.</i> Muriatic Acid.
<i>Laurus Camphora.</i> Camphor.	<i>Acidum vitriolicum.</i> Vitriolic Acid.
<i>Humulus Lupulus.</i> The Hop.	<i>Acidum vitriolicum aromaticum.</i> Aromatised vitriolic acid.
<i>Myrrha.</i> Myrrh.	<i>Spiritus Ætheris vitriolici.</i> Spirit of vitriolic æther.
<i>Oxalis Acetosella.</i> Woodsorrel.	<i>Argilla vitriolata.</i> Vitriolated argill. Alum.
<i>Papaver somniferum.</i> The White Poppy. Opium.	<i>Argentum nitratum.</i> Nitrated Silver.
<i>Pinus Larix.</i> The Larch-tree. Turpentine.	<i>Cuprum acetatum.</i> Acetated Copper.
<i>Prunus spinosa.</i> The Sloe.	<i>Cuprum vitriolatum.</i> Vitriolated Copper.
<i>Ribes nigrum.</i> The Black Currant.	<i>Natron boracicatum.</i> Borax.
<i>Ruta graveolens.</i> Rue.	<i>Acidum nitricum.</i> Nitric Acid.
<i>Carbo lignarius.</i> Charcoal.	
<i>Gas acidum carbonicum.</i> Carbonic acid gas. Fixed air.	

“ CLASS V. ANTISEPTICS.

(1) From the Animal Kingdom.

“ *AMMONIA acetata.* (See Refrigerants.) This is frequently and advantageously employed in malignant fevers.

“ *AMMONIA muriata,* Ph. Lond. et Ed. (*Sal Ammoniacus*) Muriated Ammonia. Salt Ammoniac. A neutral Salt compounded of the Volatile alkali and muriatic acid. It is given by some practitioners internally in malignant fevers, in doses of ten or thirty grains, dissolved in the camphorated mixture, bitter infusions or decoction of cinchona; but it is more frequently used in gargles and external applications.

(2) From the Vegetable Kingdom.

“ *ACETUM.* (see Refrigerants) Vinegar. This may be used in the manner described in the preceding class. It is frequently added to gargles. It may also be advantageously combined with Aromatics, as in the instance of the *Acetum Aromaticum*, Ph. Ed. which is made by infusing rosemary, sage, lavender and cloves in vinegar. A tea-spoon full, diluted with water, may be given for a dose.—It is moreover used as an odorament.—In some of the foreign Pharmacopœias there is an *Acetum Camphoratum*, which is made by dissolving Camphor in Spirits of Wine and then adding it to the Vinegar. Dose, the same as that of the aromatic vinegar. It is in like manner used for smelling to. Vinegar boiled with honey to the consistency of a syrup (*oxymel*) is used in gargles and lotion.

—By

— By others it has been combined with nitre; and such a mixture or solution (*Acetum nitrosum*) is said to be remarkably efficacious in the scurvy. (*Patterson on the Scurvy*, 1795. *Rollo on Diabetes*, 1798.) It would seem that the vinegar is the principal agent, as nitre alone is not beneficial in this disease. (*Trotter's Essays*.) When vinegar is employed to fumigate sick rooms, it should be boiled in glazed earthen pipkins and carried about the bed, but not thrown upon hot bricks and coals, or heated metallic utensils, by which it is decomposed.

“ *ANTHEMIS nobilis*. (*Chamœmelum. Herba et Flores.*) Chamomile. (See Vol. I. p. 173.) This herb and its flowers are employed in decoctions for antiseptic fomentations and clysters. It is an ingredient in the *Decoctum pro Fomento*, Ph. Lond. (formerly termed *Fotus Communis*) which is made by boiling an ounce of dried chamomile, dried wormwood, and dried southernwood, and half an ounce of dried bay-leaves, in six pints of water. Two species of *Artemisia* were surely not needful in this decoction. The wormwood (in a double proportion) without the southernwood, or the southernwood without the wormwood, would have sufficed. The *Decoctum pro enemate*, Ph. Lond. (formerly called *Decoctum commune pro Clystere*) belongs to Emollients. The *Decoctum Chamœmeli*, Ph. Ed. (called also *Decoctum Commune*) is made by boiling one ounce of Chamomile flowers and half an ounce of carraway-seeds in five pints (pounds) of water. This is used clysterwise in quantities of a pint or more, alone or with various additions.—For other remarks on this bitter vegetable and its preparations, see Tonics.

“ *ARISTOLOCHIA Serpentina*. (*Serpentaria Virginiana*.) Virginia Snake-Root. (See vol. I. p. 245.) Decoctions and infusions of this root, either alone or in combination with the Peruvian bark, are frequently prescribed in the advanced stages of low and malignant fevers. The proportions and doses have been already mentioned in the preceding Volume, under Diaphoretics; where also notice is taken of the uses and doses of the tincture.

“ *ARNICA montana*. Leopard's-bane. See Stimulants.

“ *ARTEMISIA Abrotanum*. Syngenesia. Polygamia æqualis. Compositæ. Discoideæ. Frutex. Southern parts of Europe (*Abrotonum. Folia vel summitates.*) Southern-Wood. Decoctions of the tops of this bitter-aromatic shrub are frequently used as fomentations in cases of bad ulcers, and gangrenous affections. It is an ingredient in the *Decoctum pro Fomento*, Ph. Lond. as mentioned under the article chamomile.

“ *ARTEMISIA Absinthium*. Class and Order as the preceding. (*Absinthium*) Common Wormwood. Employed, like the southernwood, in antiseptic fomentations.

“ *ARTEMISIA maritima*. Class and order as above. (*Absinthium maritimum.*) Sea Wormwood. Used in the same manner as the Common Wormwood; and is an ingredient in the *Decoctum pro Fomento*, Ph. Lond.—There is no use in swelling the catalogue of the materia medica with two species so similar in their sensible qualities and medicinal effects. One of the two, the *artemisia absinthium*,

sinthium, or this species, should be expunged. For other remarks on this vegetable and its preparations, see Tonics and Anthelmintics.

“*CINCHONA officinalis*. Pentandria. Monogynia. Contorta. Arbor. Peru. (Cortex Peruvianus.) Jesuit's bark. Peruvian bark. In petechial and other malignant fevers, in the putrid sore throat, and in gangrenous affections, the powder, decoction, and tincture of this bark, are given with good effect, joined with acids, port wine, camphor, and opium. It may also be administered clysterwise in these cases, and particularly to children labouring under the confluent small pox accompanied with a typhoid condition of the system. (Thesaur. Med. p. 184.) For an account of the preparations and doses of this valuable article of the materia medica, see Astringents and Tonics, under which classes its other and more general uses will be noticed.

“*CITRUS medica*. (Limon.) The Lemon. (see Refrigerants.) The acid juice of this fruit is given in conjunction with the camphorated-mixture, decoction of cinchona, and other antiseptics, in malignant fevers, the putrid sore throat and gangrenous affections. (Thesaur. Med. p. 174—176.)—Added to red port-wine and water, it forms a useful beverage (called *Negus*) in all such cases.—The *Succus Limonis Spissatus*, Ph. Lond. duly diluted with water, supplies the place of the fresh juice.—Repeated trials have proved that the acid juice of the lemon is antiscorbutic in a very high degree. In consequence of the testimonies produced in its favour by various physicians and surgeons, it has become a standing remedy in our Navy. The recent juice alone, or sweetened with sugar (and in some cases mixed with port wine) may be given in the quantity of many ounces in the space of twenty-four hours. If it excites diarrhœa, astringents and aromatics must be joined with it. Where the fresh juice cannot be procured, the crystallized citric acid (prepared by saturating the filtrated juice with chalk, and afterwards adding to the washed precipitate vitriolic acid, according to the processes of *Scheele* and *Dize*.—See *Fourcroy Systeme des Connaissances Chimiques*, Tom. VII.) may be employed in its place. *Lind.* on the Scurvy, 1754. *Blane's* Diseases of Seamen, 1789. *Trotter* on the Scurvy, 1792, and his *Medicina Nautica*, 1797 and 1799.

“*CITRUS Aurantium*. Class and order as above. (*Aurantium hispalense*) The Seville Orange. The juice of this may be given in scorbutic cases in the same manner as the juice of the lemon. For its Conserve, see Tonics.

“*LAURUS Camphora*. (See vol. I. p. 251.) Camphor. This resinous substance, whose preparations and doses have been already mentioned in the preceding Volume as above referred to, has been often successfully employed in petechial and other malignant fevers (*Riverius—Hoffman—Huxham—Pringle*) and in gangrenous affections; in which last it is used externally as well as internally (*Collin Observaciones circa Morbos*.) In these cases it is combined with the Peruvian bark, wine and acids. (Thesaur. Med. p. 171—174.) It has also been administered clysterwise with the best effect to children

dren labouring under the confluent small pox accompanied with a typhoid state of the system. *Buckner de usu Cort. Per cum Camphora remixt. in febris ex putredine ortis. 1762.*

“ *HUMULUS Lupulus*, Diccia. Pentandria. Scabridæ. Indigenus. (*Lupulus Coni.*) The Hop. Poultices made of the dried blossoms or cones, macerated in water, have lately been applied to ill-conditioned and gangrenous ulcers, with very good effect. *Trotter's Med. Nautica, Vol. II. Duncan's Annals of Medicine, Vol. II.*

“ *MYRRHA*. (See vol. I. p. 147.) Myrrh. Solutions of this gum-resin in spirit of wine (see *Tinctura Myrrhæ*, Vol. I. p. 294) are frequently employed in lotions for foul ulcers, and in gargles against the gangrenous sore throat. In the last-mentioned cases it's more volatile particles may be conveyed to the fauces along with the vapour of hot water or vinegar. *Thesaur. Med. p. 183.*

“ *OXALIS Acetofella*. Decandria. Pentagynia. Gruinales. Indigenus. (*Lujula. Folia.*) Woodforrel. The juice of this plant abounds in a peculiar acid termed the Oxalic; which, like the citric, is powerfully antiscorbutic.

“ The *Conserva Lujulæ*, Ph. Lond., (Conservé of Woodforrel) is prepared by bruising the leaves in a marble mortar, and then beating them together with thrice their weight of double-refined sugar. A tea-spoon full or more may be given occasionally.—The expressed juice may be taken in the same manner as lemon-juice. What is termed the *essential Salt of Woodforrel* (obtained from the expressed juice by filtration, evaporation and crystallization) is not pure oxalic acid, but an acidulous salt (like the crystals of tartar) composed of the vegetable alkali supersaturated with the acid of forrel. Half an ounce of this salt dissolved in fourteen or sixteen ounces of hot water, duly sweetened, forms when cold, a pleasant and useful beverage in malignant fevers.—The pure oxalic acid, which is identical with the acid of sugar, is not used in medicine. *Savary de Sale Essentiæ Acetofellæ, 1773. Fourcroy Système des Connoissances Chimiques, Tom. VII.*

“ *CARBO lignarius*. (Carbonium.) Charcoal. Carbon. Charcoal duly prepared from wood, and reduced to a fine powder, has been applied to foul ulcers and mortified parts with apparent advantage. The powder may be mixed up with boiled bread and milk, and applied in the form of a poultice. *Crell's Chemical Journal (English Translation) Vol. III. Beddoes on Facitious Airs; and Simmons' Med. Facts and Observ. Vol. VII.*

“ *GAS ACIDUM carbonicum*. Aër fixus. Gas Mephiticum. Carbonic Acid Gas. Fixed Air. Mephitic Air. This elastic fluid is obtained for medicinal purposes by pouring vitriolic acid upon chalk or marble. The gas thus extricated may be combined with water (pure or with additions) by means of an apparatus, in common use, invented by Nooth. Water thus impregnated with the carbonic acid gas is prescribed with good effect to patients labouring under typhus and other malignant fevers. It may be drank in the same quantities as pure water.—Much of the effi-

eacy of the acidulous soda-water depends upon its saturation with this air; which is likewise a principal agent in the saline effervescing draughts (being extricated from the prepared kali on the admixture of vinegar or lemon-juice) and in all fermented bottled liquors, when in a sparkling state. Besides being taken in these ways into the stomach, it has also been frequently drawn into the lungs in certain diseases of that organ, and particularly in the advanced stage of phthisis pulmonalis. (*Percival's Essays*, Vol. I.) In this disorder, however, it has disappointed expectation in some late trials. Externally it has been applied to foul and cancerous ulcers with temporary good effect. (*Ewart's two Cases of Cancer*, 1794.) But even here it seems to act merely as a palliative. Whatever efficacy the Fermenting-Cataplasm (*Thesaur. Med.* p. 180) possesses, it is wholly to be ascribed to this gas, which is gradually evolved from it. See *Beddoes's* publications on Facitious Airs. Also, *Pearson* on the different Kinds of Air, 1795.

"FERMENTUM cerevisiæ. Spuma cerevisiæ fermentantis. Flos cerevisiæ fermentantis. Yeast or Yest. Within these few years this substance has been cried up as an excellent remedy in malignant fevers. Various testimonies have been produced for and against its antiseptic virtues. At present the evidence on both sides is nearly equal; it is therefore a matter which must lie over for future decision. It is given internally in doses of a table-spoon full, mixed with water, porter, or wine and water. [In the last case, how much may be owing to the Wine?] Externally it has been applied to foul ulcers in the form of a cataplasm. It seems to promise more success as an outward than as an inward remedy. Whatever may be its effects, they are to be ascribed partly to the carbonic acid and partly to the bitter principle of the hop which it contains. See *Beddoes's* Considerations on Facitious Airs, and *Medical and Physical Journal* for 1800 and 1801.

"CEREVISIA. Malt liquor. (See Vol. I. p. 102) Fresh table beer, spruce beer, porter and bottled beer, are good antiscorbutics, and are often administered in low and malignant fevers, with the best success. It is only when they have too laxative an effect that their use in such cases becomes improper.

"VINUM. Wine. (See Vol. I. p. 104) In the advanced stage of typhus and other malignant fevers, and in mortifications, Port Wine is perhaps the most powerful of all antiseptics. In such disorders it may be given to the quantity of several pints within the space of twenty-four hours.—Claret is preferable to port wine in many of these cases.—Perry and Cyder, which may be considered as weaker sorts of wine, may be employed for the same purposes.—In the fevers above-mentioned it is a proof that wine and other fermented liquors agree, if, during their use, the tongue becomes more moist, the skin more soft, the pulse less frequent and more full, and the affection of the brain more moderate. Where the contrary effects are observed, they should be diminished or discontinued.

"SPIRITUS vini. (Vol. I. p. 105) Spirit of Wine. Ardent Spirits. Brandy is sometimes employed internally in the last stage.

stage of petechial fevers, gangrenous fore throats, and in the black-vomiting of the yellow-fever; in which last it is perhaps more to be relied upon than any other medicine; but in the common low and malignant fevers of this country it is seldom adviseable to exhibit it otherwise than in a state of dilution with water and admixture with acids, as in the state of Punch; a liquor which may in some measure supply the place of wine.—Externally spirit of wine is employed, alone or combined with camphor, as an embrocation and fomentation in bruises and mortification.

“(3) *From the Mineral Kingdom.*

“*AQUA frigida.* In malignant and pestilential fevers Cold Water, employed internally and externally, in the manner and with the cautions mentioned under Refrigerants, proves a most powerful antiseptic. If saturated with the carbonic acid gas or mixed with vinegar, it is, in the opinion of some practitioners, still more efficacious.

“*ACIDUM muriaticum.* Muriatic Acid. (*Spiritus Salis Marini.*) See Refrigerants. This acid, added to water in such quantities as render it pleasantly sharp to the taste, affords an useful medicine in typhus and other malignant fevers; but we must not imagine with a modern German physician, Professor *Reich*, that this and the other mineral acids are, without the aid of other agents, adequate to the cure of all fevers. They are even hurtful in some conditions of fever. It may likewise be prescribed in gargles in the cynanche gangrenosa. For these purposes however does it possess any advantage over the vitriolic acid? (*Fordyce* on the Virtues of Muriatic Acid in the cure of putrid diseases, 1789.) The muriatic acid vapour, extricated from sea-salt by pouring strong vitriolic acid upon it, is often employed for fumigating the apartments of those who have laboured under infectious fevers. The oxygenated muriatic vapour or oxy-muriatic vapour (obtained by mixing pulverized manganese with the salt, before the vitriolic acid is added) answers still better for the fumigating process than the common acid vapour. See *Guyton-Morveau* in the *Annales de Chimie*, 1801, and *Rollo's* Account of the Artillery Hospital at Woolwich, 1801.

“*KALI oxmuriatum.* *Lixiva oxmuriata.* *Murias oxygenatus potassæ.* Oxymuriated kali. Oxymuriated lixiva. Oxygenated muriat of potash. A salt compounded of the vegetable alkali and the oxygenated muriatic acid. It has lately been employed with good effect in cases of typhus. Dose from three to five grains. *Garnett* in *Duncan's* Annals of Medicine, Vol. II. and III. Also *Medical and Physical Journal*, 1801.

“*ACIDUM vitriolicum.* Vitriolic acid. (See Refrigerants) This acid is employed in malignant fevers, diluted with water, in the same manner as the muriatic acid; but it is more frequently mixed with decoctions of cinchona, angustura, contrayerva, &c. It is also employed in gargles. Dose of the diluted acid (*Acidum vitriolicum dilutum*, Ph. Lond. twenty or forty drops.—The *Acidum vitrioli aromaticum* Ph. Ed. (formerly called Elixir vitrioli acidum)

is made by mixing (cautiously) six ounces of vitriolic acid with two pounds of rectified spirit of wine, and digesting in a gentle heat for three days; afterwards adding an ounce and a half of cinamon, and one ounce of ginger, and digesting again for six days; then filtering. Dose thirty to sixty drops, in water, decoction of cinchona, &c.—*Spiritus Aetheris vitriolici*, Ph. Lond. et Ed. (formerly called *Spiritus vitrioli dulcis*.) see p. 43. Sixty or eighty drops of this dulcified acid may be given for a dose (joined with camphor or other aromatics) in malignant fevers. See *Car-michael Smyth* in *Med. Communications*, Vol. I. Also on the *Jail Distemper*, 1795, &c. &c.”

MEDICAL AND PHYSICAL INTELLIGENCE.

[FOREIGN AND DOMESTIC.]

OF THE MOVEMENTS OF ODOROUS SUBSTANCES, PLACED ON THE SURFACE OF WATER.

Citizen Benedict Prevost has made several curious inquiries concerning the movements of odorous substances placed on the surface of water, of which the following is an extract. It is a fact long known to Naturalists, that small pieces of camphor, placed on water, move round, and turn with the greatest rapidity; a phenomenon which has also been observed by Messrs. Volta and Brugnatelli to take place with benzoic and succinic acid. Cit. Benedict Prevost, however, has shown, that a great number of different odoriferous substances possess this remarkable property. But though the fact itself is sufficiently ascertained, Naturalists differ very much in the explanations they respectively give of this curious phenomenon. Cit. B. P. attributes these movements to the emanation of the odorous particles; an opinion which he has built on numerous experiments. Mr. Venturi, however, professor of natural philosophy at the university of Modena, applies to these phenomena the explanation which is given by Cit. Monge, of the seeming attractions of bodies that are floating on the surface of water; and, according to him, the water has more attraction for the solid camphor than for the little portion that is dissolved in it, and with which it is saturated; it rises along the solid piece, describing there a curvelined inclined surface, along which that little dissolved portion descends, and in coming down repels, according to the mechanic laws, both the surface itself and the solid body to which it adheres. This effect however, he thinks, ought not to be

be mistaken for the repulsions which the air, imbibed by ether, or the hot exhalations of camphor, produce on light bodies that are floating on the surface of water, as in this case the presence and influence of an elastic fluid appears evident. Doctor Corradori is of a different opinion, and he endeavours to explain this movement by an elective affinity of a kind of oil, which he supposes to proceed from the camphor at its contact with water. He thinks, that the repulsion of the water which takes place when we put camphor or other odorous substances on a china plate, or on wet glass, is effected by the elective attraction of the surface of the plate or glass for the oil emitted by those substances, and, as he imagines, it is the oil which repels the water, and takes the place of it. For supporting his opinion, Dr. Corradori asserts, that camphor does not move on water, if it is inclosed in very small vessels, because he never was able to move small plates of metal, by placing on them pieces of camphor, and letting them float on water; an experiment which, however, proves successful, when proper care is taken, and the utmost accuracy employed.

Cit. Prevost has replied to Dr. Corradori, in a memoir addressed to the *Société Philomatique* at Paris, which is entitled, "*Nouvelles Experiences sur les Mouvements spontanés de diverses Substances à l'approche ou n contact les unes des autres.*" The principal facts contained in this paper are the following: A drop of ether placed on a plate of tin, of the weight of 13 grammes (about $3\frac{1}{4}$ drachms) made the water move with velocity, though it did not touch the surface of it. Thus the ether acts on the water at a distance; a fact, which may be proved in a very simple manner: A small plate of tin placed on water, will give way on approaching it at a distance of some centimetres with the end of a glass tube moistened with ether. Small pieces of camphor thrown on well dried quicksilver will experience the same movements as water; but for making this experiment succeed, it is necessary to clear and dry the quicksilver as much as possible, as the smallest particle of oil or grease that is left on its surface will stop the movements. The pieces of camphor, however, must be very minute, the reason of which will be afterwards explained. Very minute scales of mica, loaden with a small piece of camphor, and placed on quicksilver, move as on water. The benzoic acid turns likewise on quicksilver, but it must previously be reduced to extremely minute particles: an areola of oil forms itself around them when they are placed on the surface of water, which phenomenon is never to be perceived in camphor, even by means of a microscope; but the metallic glass of the quicksilver is not changed by it. It results from these facts, that the presence of water is not always required for these movements. As the movements will proceed on plates of alum, gum arabic, and of earthen ware, as well as on a moistened china plate, it appears, that no particular elective attraction of the oily or odorous substance to the plate takes place. The camphor likewise moves in very narrow vessels, notwithstanding the above assertion of Dr. Corradori; for Cit. Prevost has seen it move and

turn in capillary tubes, into which it was brought in extremely minute particles. Cit. Prevost is inclined to admit in these phenomena an intervention of an elastic fluid. To these observations Cit. Biot makes the following additions, by which the question concerning the movement of the camphor on water may be decided. When we cut a small piece of camphor in the shape of a cone, and hold the point of it towards a small piece of gold leaf that floats on water, this will be repulsed, as soon as we bring the point of the cone to it, within the space of 4 or 5 millimetres, in which way we may drive it all over the surface of the water without ever being able to touch it: the water, however, must be very pure, and the vessel perfectly clean. We may hold the camphor with a pair of pincers, or put it into the end of a glass tube; but it must have the shape of a small cone, as a larger piece of an irregular figure would involve the light body into its atmosphere, and thus prevent its easy movement. The same effects are produced, on taking, in place of the camphor, a small piece of fine sponge impregnated with camphorated water, or a glass tube, moistened at its end with a few drops of the same solution.

When we cover a china plate with a thin stratum of water, and apply to it at a distance of a few millimetres, the point of the above cone, so that the axis of the cone be perpendicular to the surface of that stratum, the water will give way beneath the cone, and form a concentric circle with it, the interior of which is coloured with rainbow coloured rays, proceeding from the continuation of the axis, and extending themselves from within towards without with a rapid movement. A few moments after, the circle begins to discolour itself from the centre towards the circumference, and the iris disappears whether we continue to hold the camphor above the surface of the water or not: this phenomenon has been observed at a temperature of 15° Reaumur. On throwing a small piece of fine sponge impregnated with ether on water, it begins to move as camphor, and a hissing sound is heard, similar to that when water is evaporated on a hot iron. On looking horizontally at the surface of water, we may perceive small sparkling particles proceed from the sponge, which extend themselves on the water in a serpentine direction at the distance of some centimetres, producing their irises, similar to those of the preceding experiment; but they disappear shortly. During this emission, the sponge has a progressive and a rotatory motion, which are evidently owing to those sparkling particles, to the impulsion of which it constantly yields. The two first of these experiments inform us, that the camphor acts on water at a distance, and without touching it, and the third enables us to perceive the manner in which these movements proceed on that fluid.

From these facts we may now certainly draw the following conclusions.

Camphor moves on water by means of the emission of its component particles, an emission which becomes perceptible to our senses by the odour that attends it, and by the repulsions which it
exerts

exerts against the small light bodies that are floating on water.— This emission proceeds at all points of the surface of camphor, but more rapidly where it is on the same level with water; the centre of the camphor has a progressive motion, but the body itself a rotary motion. As the figure of the piece of camphor is changing every moment, the movement of its centre of gravity is neither uniform nor rectilinear, but varies continually. The quickness with which the camphor moves is greater the smaller it is in size, and consequently the motion increases, or is accelerated in proportion as the camphor evaporates. In the second part of his memoir, Cit. Prevost relates a great number of experiments made with inodorous substances, which produce on moistened glass the same appearances as odorous substances, oily or volatile. When we spread on a china plate moistened with a thin stratum of water, a small piece of wet fine linen, the water seems to be repelled around it, and to form a great quantity of rainbow coloured rays. These phenomena will be produced with all substances, animal as well as vegetable, with all sorts of liquors and saline solutions, and they do not only take place on a china plate, but also on plates of gum arabic, alum, &c.

Cit. Prevost concludes from these experiments, and several others, analogous to them :

1. That all liquors have the property of repulsing each other.
2. That all dry organised substances, or those that preserve a particle of organisation, emit on absorbing water an elastic fluid, which attracting part of the water, repels that which is around it on a moistened glass pannel. The first conclusion, however, seems to be contrary to the general law of the mutual attraction of the atoms of matter with respect to the hypothesis of an elastic fluid; it ought to be suggested, that before we have recourse to ascribing these phenomena to new causes, we should endeavour to explain them according to those which we already know, and distinguish the effects produced by odorous substances, from those occasioned by inodorous substances; in which manner we may, with greater probability, account for the repulsion of fluids by linen or paper, &c.; and this repulsion, perhaps, arises from the water running down the inclined surface which those substances have made around themselves on imbibing the fluid.

On the true Difference between the Crocodiles of the Ancient and of the New World, by Citizen CUVIER.

Naturalists have hitherto extremely disagreed with respect to the number and character of the species of crocodiles, and the synonymous terms, as well as the different figures, have been extremely confounded; and notwithstanding the variety of opinions on this subject, truth had escaped their researches. Cit. Cuvier, however, having examined more than sixty crocodiles of all sizes, found they may be reduced to two species, the character of each of which he determines in the following manner.

Crocodile with an oblong snout, whose upper mandible is cut out

on each side, to give room to the fourth tooth of the lower jaw; the hind feet are intirely palmated or web-footed.

Caiman with an obtuse snout, whose upper mandible receives the fourth tooth into a particular hollow, where it lies concealed; the hind feet are but half palmated.

The first species occurs only on the continent of the ancient world, but the second is found in the new world.

The Surgeons of the Fleet have generously presented their friend and Physician, Dr. Trotter, with a piece of elegant plate, to the value of one hundred and ten guineas, in remembrance of the manly and liberal sentiments he has expressed in favour of this neglected body of officers. The following is the inscription.

Doctōri THOMÆ TROTTER;
Classis Regiæ Medico Primario;
Multa de Patria bene merenti;
Hoc Munusculum,
Pignus observantiæ summæ,
Chirurgi Navales
Lubentissime offerunt:
Et publicæ salutis, et privatæ amicitiaë,
Testimonium sacrum esse
Voluere.
1802.

A COURSE OF CLINICAL LECTURES on the Principles and Practice of Medicine, will commence early in October next; taken from cases of the patients of the Finsbury Dispensary in St. John's Square. By *Thomas Jameson*, M. D. Member of the College of Physicians of London, and of Edinburgh, and one of the Physicians to the Finsbury Dispensary. Three Lectures will be delivered every week between the hours of eleven and twelve o'clock at noon, for a term of three months; and the patients of the Dispensary will also be examined from twelve to two o'clock on the same days. Students will have an opportunity, which is seldom to be met with, of observing diseases from their commencement to their termination. To accommodate Hospital Students, the terms will be three guineas for the Lectures, and five guineas to those who attend both the Lectures and Dispensary practice.

TO CORRESPONDENTS.

Dr. Patterson's request will be complied with as soon as possible. Mr. W's communication could not have been admitted without the retrenchments he complains of; and the Editors, in compliance with the opinions of many respectable Correspondents, intend in future to admit no personalities which they think inconsistent with the character of a polished scholar.

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