ON THE
MEDICAL PROPERTIES
OF THE
SUBCARBONATE OF IRON.

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IT is now four years since I published an account of the large doses that may generally be given of the pulvis antimonialis without any sensible effect *. I purpose to shew that almost equally unexpected quantities of another medi-

* Numerous Cases illustrative of the Efficacy of the Hydrocyanic or Prussic Acid in Affections of the Stomach, &c. 1820.

I found that frequently two or three, and sometimes upwards of five, scruples might be taken two or three times a-day, without nausea, purging or other apparent effect, by persons labouring under the most trifling complaint, such as a slight and local cutaneous affection. I am well aware that, when a violent morbid condition of the system exists, the operation of agents in general is impeded, and have mentioned, in the same work, some striking examples of the large doses of medicines that

cine may be given. But, while the pulvis antimonialis never appeared in the slightest degree

are required in diseases of extreme violence to produce the ordinary effect.

The attainment of such large doses of the pulvis antimonialis was indeed gradual, but not so slow that the circumstance could be explained by supposing that the system had become habituated to the remedy. The augmentation was usually five grains, but sometimes ten, fifteen, or twenty. The following case, which occurred soon after the publication of the others, will place this point beyond dispute.

A footman in my father's family, twenty years of age, had a catarrh, went to bed in the evening, and took ten grains of pulvis antimonialis and a basin of gruel. The next morning I found he had experienced no effect from it; had neither felt sick, had a motion, grown cooler, or improved at all, and I gave him 3ss. In the evening no effect had been produced, and I gave him 3j. The second morning I found that no effect had occurred, and I gave him 3jss. This, in an hour, excited vomiting. He three times discharged a great deal of green bile, had one motion, and his headache, hoarseness, cough, and tightness across the chest, were at once greatly relieved. As the medicine had been efficient, I was desirous of knowing whether a smaller dose would now act, and therefore gave him 3j. in the evening. It had no effect.

The articles on which my observations were made, came from a variety of houses, and were often the best I could procure, and one quantity was manufactured expressly for me, according to the letter of the Pharmacopœia.

Since a drachm and a half or two drachms will occasionally derange the stomach in adults, and a grain or two generally in children, I should be sorry to assert that the pulvis antimonialis is absolutely inert, but am convinced that its ordinary exhibition serves no other purpose than to amuse the patient and the practitioner.

The peroxide of antimony is said to be perfectly inert. In

beneficial, however large the quantity taken, when it produced no sensible effect, I am happy not only to confirm the reputation of the medicine to which I have at present the honor of soliciting the attention of the Society, but to furnish some facts by which I trust it will be heightened.

I.

The usual doses of the subcarbonate of iron are, I believe, from fifteen to thirty grains, and

specimens of the pulvis antimonialis obtained from two respectable houses, Mr. Philips found 100 grains to contain between 60 and 70 of phosphate of lime, and the rest to be peroxide of antimony. Mr. Brande found the pulvis antimonialis sometimes to be little more than phosphate of lime; sometimes to contain peroxide, and at others protoxide, of antimony. The inertness and uncertainty of the medicine are thus fully explained.

On analyzing James's Powder, Mr. Philips ascertained the composition to be nearly equal parts of phosphate of lime and peroxide of antimony. The reputation of this quack medicine I should therefore imagine to arise both from the successful efforts of nature and from the simultaneous employment of bleeding, purging, and other vigorous measures in severe cases, and of copious diluents, a warmed bed, &c. in those slight catarrhal cases in which above all it is celebrated.

I may perhaps be permitted here to state, that very extensive experience with Prussic acid for four years, has fully confirmed all I published respecting it in the work referred to, and has not furnished me with any additional information, except that it is equally successful against violent and chronic hiccup as against other symptoms of disordered stomach, and that it will in some cases cause ptyalism and irritation of the mouth, as noticed by Dr. M'Leod.

these are given two or three times a-day. Some few practitioners, I know, exhibit occasionally a drachm at a dose, but they consider this a large quantity ; and Dr. Hutchinson, who has written upon the virtues of the medicine in neuralgia, and probably employed it more than most others, tells us that the greatest quantity he has ever found necessary is ninety grains in the twenty-four hours. His mode of expression leads to the supposition that this is the largest quantity he has ever given. Mr. Carmichael has employed it as extensively as Dr. Hutchinson, and appears, from his narrations in the work upon the efficacy of iron in cancer, to have generally given less than a drachm in the twenty-four hours, and once only so much as four scruples. But I have ascertained, by very numerous trials, that, when the use of the medicine is proper, it may be given in far larger quantities : that two, three, and four drachms may be given every six, nay every four hours ; that this dose of half an ounce may be at once commenced with, and does not require, in order that it may be borne, to be reached by slow degrees, and that it may be continued many weeks without the slightest inconvenience.

I have become acquainted with these facts during the last twelve months. It had for many years been my custom to prescribe the medicine in drachm doses, but having, about a year ago, several cases in which its exhibition appeared proper,

and never having observed any sensible effect from it, I began to think that a drachm was probably not the utmost quantity which the stomach would bear, and resolved to ascertain, by cautious augmentations of the doses, how much might be taken. It soon became evident that there was no occasion for timidity, and my uniform experience in nearly a hundred cases enables me to present the results just stated. When the medicine is proper, I believe there is generally no limit to the quantity which may be taken, except the unwillingness of the patient to swallow it and the inability of the stomach to manage so heavy a mass. Neither headache, thirst, heat, foulness of tongue, griping, nor constipation has occurred*, nor been increased if already present. Nay, pain and heat of the head and giddiness existed already in some cases, and ceased during its employment.

I am enabled to say that these quantities are ordinarily borne, exactly as is the case with the pulvis antimonialis, not because the operation of

* I wish not to assert that such inconveniences will never occur, but the absence of them in all my trials justifies me in believing that they will not prove common occurrences, with even half ounce doses. Many practitioners are no longer deterred from giving iron by headache, foulness of tongue, &c. if other circumstances indicate its employment. I believe that when it excites and disturbs, this arises from a peculiar susceptibility to its influence, as I shall endeavour to prove with respect to the oil of turpentine, unless, of course, the system is already in a highly excitable state.

the medicine is resisted by an unnatural condition of the system, not because the quantity is gradually reached, and not because the article is bad. The article was procured from a variety of druggists, from many of the most respectable houses in London, and was in fact, in several examples, known to be a genuine article prepared according to the letter of the Pharmacopœia*.

Whether there is any advantage in these very large quantities I cannot say. A drachm dose may perhaps be as useful as one of half an ounce. Even when large doses effected all the good desired in my cases, after small ones had failed, it may be urged that not the increased quantity, but the continuance, of the remedy, produced the effect, and the question can be decided only by a comparison of cases, similar in every respect, treated one half by common and the other by large doses.

Reasoning analogically, one would conceive that large quantities must be more serviceable. Cinchona, for instance, will cure an ague in doses of a drachm, given every two hours, when two or

* If the articles used by me were all proved to be bad, the importance of my facts would remain little diminished (and the same would hold in regard to the pulvis antimonialis), because the variety and respectability of the houses at which the medicine was purchased, shew that the facts, if not true of genuine subcarbonate of iron, are true of the subcarbonate in common use.

three table-spoonfuls of the decoction three times a-day, or even a drachm of the substance given not more frequently, altogether fails. We are accustomed to increase the doses of all medicines for the purpose of increasing the effect. In the very example of subcarbonate of iron, practitioners prescribe sometimes what they consider a small dose, sometimes what they consider a large one, according to the force which they judge necessary to bring up against the disease ; and they increase the quantity as the disease proves obstinate. Now since it appears that the dose of this medicine has a much wider range than has been thought, and that the terms large and small must relate to quantities different from those to which they have been hitherto applied, the same habit of practice would incline one to these large doses in obstinate cases, unless such comparative observations, as have been just alluded to, prove them to be no wise superior to what have hitherto been considered large. It may be worth while, too, here to quote a passage from Cullen. “ We are persuaded that the good effects of the preparations of iron have often been missed by their being given in too small doses. The saline preparations, in large doses, are ready to irritate the stomach ; and both on this account, and on some other considerations, it may always be proper to begin with small doses, and to increase them by degrees ; but we have often found, that no great benefit is to be obtained but when large quantities, either by the size of

the doses or by the continuance of them, have been thrown in.”*

I may remark that Sydenham's favourite form of iron was the filings, and that Cullen says, “we have found the simple rust as effectual as any other preparation, and we have always found the stomach bear it better.”

It is right, however, while quoting Cullen, to mention that he also says, “We have been informed of its being given to the quantity of six drachms in one day; but we have hardly found any stomach that would bear the third of that quantity without sickness.” The apparent variance of his experience from mine is easily explained. He employed the *rust* of iron. Such only was the carbonate of the Edinburgh and also of the London Pharmacopœia, when he published his *Materia Medica*. My observations relate of course to the present preparation of the London Pharmacopœia, procured by *precipitation*, and therefore an impalpable powder. The grittiness of the rust would soon turn the stomach of any one, if administered in large quantities.

Before concluding this first division of my subject I may state, from equally abundant experience, that a scruple of the sulphate of iron, made into pills with the extract of gentian, is borne

* *Materia Medica*, Vol. II. p. 23.

just as well as half an ounce of the subcarbonate*, and that every observation which I have made respecting this dose of the latter applies nearly to that dose of the former. I have occasionally given more, and even in solution, without sensible effect.

II.

A case of paralysis agitans, as it is termed, fell under my care, and, like every case that I shall detail, at St. Thomas's Hospital. After fruitlessly trying what seemed all the most probable means of curing it, I fancied that, as the subcarbonate of iron exerted considerable power over neuralgia, a disease of the nervous system whose proximate cause is unknown, it might perhaps prove useful in what is equally a disease of the nervous system, and whose proximate cause is also a mystery. The following is the case.

“ April 17, 1823. Joseph Deacon, aged twenty-eight years, ill one year. Constant shaking of the legs and arms. The intensity of the tremor varies. Till within the last week, the agitation would sometimes cease for a few hours or even a whole day, but for the last week has been constant. At first, sometimes only one leg was affected, sometimes both. He has pain in the head, loins, and legs, and vertigo, and cannot fix his attention.”

* I myself took a scruple three times a day for several weeks without any sensible effect.

I at first brought out and maintained a copious crop of pustules on his legs by the ointment of tartarized antimony*.

He next took ʒj. of oil of turpentine, and then ʒij. every other day for above a week†.

* A remarkable effect of the free application of this remedy to the lower extremities, is the production of pustules upon the genitals. I have ordered this application of it in very many cases of rheumatic pains, and, when Dr. Jenner's work upon its virtues appeared, subjected the legs of a host of patients to its irritation, as in Deacon's case, with the hope of removing the disease of a distant part. In the greater number of examples, the appearance of pustules on the legs, even when the ointment was rubbed entirely below the knees, was accompanied by a crop of pustules chiefly upon the scrotum, but also upon the glans and other parts of the penis, and sometimes in the perinæum, groins, and on the verge of the anus. Similar consequences resulted in females. The friction on the abdomen with the ointment has occasionally had the same effect. I have never noticed the same circumstance when the ointment was rubbed on other parts, unless the patient was careless and dirty, and touched the genitals with it.

It is with the deepest regret that I state my failure with this ointment, employed with the view of curing or lessening the various diseases of distant parts for which the ever-to-be-revered Jenner hoped that he had found a remedy. But I fully value the ordinary use of the tartarized antimony in the immediate neighbourhood of diseased parts, although convinced that, even in chronic cases, blisters are often of not at all inferior, and often of superior, efficacy.

† The circumstance of large doses of the oleum terebinthinæ rarely causing irritation of the urinary organs, is generally explained by supposing that their quick escape by the intestines prevents its absorption. This appears unsatisfactory

He then went through a course of sulphate of zinc, taking at first gr. j. and at length gr. vijss. every six hours, but the dose was reduced to gr. vj. on account of nausea. During this course, his head was kept constantly wet with a cold spirituous lotion, he was cupped on the occiput, had a blister on the forehead and another on the occiput kept open nearly a month with sabine ointment, and eight leeches applied daily to the temples from the 20th to the 31st of May, and took frequent purgatives : yet he was no better.

June 3. I prescribed ʒss. of the subcarbonate of iron every eight hours, with eight leeches to the temples every other day, and a perpetual blister to the forehead, on account of the violent pain of

to me, because, 1. I have frequently known a large dose remain in the alimentary canal four and twenty hours, and longer, and yet not be followed by irritation of the urinary organs. 2. Now and then a large dose, although it pass off quickly by the bowels, produces great irritation of the urinary organs. 3. A large dose passing rapidly through the intestines and not irritating the urinary organs, often makes the urine smell strongly of turpentine for many days, shewing that absorption has taken place. 4. A very small dose will sometimes irritate the urinary organs exceedingly. 5. A dose of a drachm or two, insufficient to stimulate the intestines to its expulsion, rarely excites irritation of the urinary organs. I cannot therefore but think that the serious irritation of them which has occasionally resulted from turpentine, has been the effect of idiosyncrasy,—of a strong susceptibility of them to be affected by it:—that a large and a moderate dose would each have proved irritating in the individuals.

the head, the vertigo, and the heat and smarting of the eyes.

June 7. He felt already better.

June 11. The dose was increased to 3j. and the leeches continued.

June 14. 3jss. for a dose.

June 17. Still better in regard to the shaking, but the headache, vertigo, &c. as before.

June 21. 3ij. for a dose. Another perpetual blister to the forehead, the last having healed.

July 1. He felt so satisfied that neither the blisters nor leeches had procured the least relief to his headache, vertigo, or the pain and smarting of the eyes, and these symptoms had so clearly not been aggravated by the iron, that the former were discontinued, and the dose of the latter augmented to 3ijss. three times a-day.

July 8. 3iij. for a dose. The shaking was lessening rapidly, *as well as the vertigo, headache, &c.*

July 12. Still better. 3iij. four times a-day.

July 15. Scarcely any shaking observable. No

headache, vertigo, or any other unpleasant feeling about the head.

Finding himself so well, he left the hospital by his own desire July 17th, taking with him a sufficient quantity of his medicine to last a month. I saw him several months afterwards perfectly well.

The successful issue of this case* induced me to exhibit the same remedy in chorea, and the following cases prove its great power over the disease.

CASE I.

Sept. 11, 1823. Elizabeth Spencer, an emaciated, pale, ugly girl, aged fourteen years. Ill with universal chorea ten days, but the right arm has been affected for three weeks. One of the most frightful cases I ever witnessed. She not only cannot walk or stand, but is with difficulty kept in bed, or in the arms of any one, even by two or three persons. She cannot speak, and is continually screaming. She had squinted

* I must mention that a case of the same nature in an old woman lately occurred to me, and was not at all benefited by the remedy, though pushed to the greatest extent and long continued: but it was of several years' standing. Sometimes the bowels are obstinately sluggish, and purgatives and even bleeding are very serviceable.

with the right eye from birth, but her squint is now horribly increased, and is, in fact, with both eyes. She never sleeps, and has suffered three epileptic fits during the last week. She was bitten in the left leg four months ago, and very much frightened. Her bowels were always regular till this week, and she has now had no stool for four days.

She was ordered grs. viij. of submuriate of mercury on this and the following day.

Sept. 13. ʒss. of the subcarbonate of iron every six hours; on the 16th ʒijss.; and on the 21st ʒj.

In a few days she was less agitated, and left off screaming; in a week she required no straps to confine her in bed. She presently could sit, stand, and walk alone, and at the end of a month was perfectly well. Her medicine was continued till the completion of six weeks (Oct. 23), when I dismissed her with a supply of it for a fortnight. During the course of iron she took aperient medicine but once or twice, and I saw her some months afterwards in perfect health.

CASE II.

April 29, 1824. Sarah Evans, aged twelve years, afflicted with chorea five weeks. She had a discharge in the left thigh from a diseased hip-

joint for four years, and it ceased three or four days before the chorea began. At first there was violent pain of the head, but this yielded to leeches and a blister, and strong purgatives. The latter were continued during the whole of the first fortnight, at the end of which she became much better and remained so for a week, when the chorea became as violent as ever. For the last three weeks she has taken medicine smelling strongly of turpentine. Is now rather better, but constantly in violent motion, so that she can neither stand nor sit, and can be scarcely kept in bed ; nor can she articulate. The pulse is 120, and there is great heat. The bowels are relieved once a-day.

I prescribed 3j. of the subcarbonate of iron every eight hours.

May 4, she could sometimes hold things in her hand. On the 8th, was much quieter, and could talk a little. On the 18th, could stand and walk alone, and in a few days was perfectly free from disease. She was dismissed, June 3, with a supply of medicine for a fortnight. She took opening medicine but once or twice while in the hospital.

CASE III.

Sept. 11, 1823. Ann Guinn, aged eight years. Has had chorea a fortnight. Laboured under it

twice before ; once two years ago, and has recovered from the last attack eight months. *The head aches*, but the bowels are regular.

Eight leeches were applied to the head, and six grains of submuriate of mercury given on the day of admission and the subsequent day. Her diet was to be vegetable.

Sept. 13. There was no improvement ; 3ss. of the subcarbonate of iron three times a-day was prescribed, with ʒiij. of castor oil every other day.

On the 16th she was much better, and on the 21st scarcely any agitation was perceptible. I therefore dismissed her, ordering a supply of medicine for two or three weeks. By some mistake of her mother's she did not obtain it, and a fortnight afterwards I saw her again affected with the disease, but in a much less severe manner. I furnished her with a good quantity of the medicine, but did not hear of her afterwards.

CASE IV.

April 8, 1824. Elizabeth Powel, aged twenty-two years, ill with chorea six months. Had the disease six years ago. The right side most affected. *Pain of the forehead, especially on stooping.* Has been bled and purged without benefit.

3ij. of the subcarbonate of iron every eight hours were ordered.

On the 13th she was rather better, and on the 17th much better. Her speech was greatly improved, and she could hold any thing in her right hand. *The pain of the head was quite gone.* She afterwards complained of pain in her left side, which was removed by two bleedings. She was dismissed on the 18th perfectly well.

CASE V.*

Aug. 12, 1824. Elizabeth Howel, aged eleven years, affected with chorea five weeks. Her sister, thirteen years old, has laboured under it two months. *She has a florid complexion, and is in high condition.* The right side is much more affected than the left. Occasional headache; the bowels usually costive.

* The four following cases occurred after the paper was presented to the Society; but, more than a year having elapsed between its reading and its publication, I have seized the opportunity of inserting them. During this time, successful examples of the same mode of practice have appeared in print, and others have been mentioned to me by friends to whom I had recommended it. In these four cases it will be remarked that no aperients were once thought of, for I had become better acquainted with the properties of my remedy, and in two of the former three in which they were prescribed, it is evident that they could not have contributed in the least to the cure.

She was ordered $\mathfrak{zj}$. of the subcarbonate of iron every six hours.

On the 31st the dose was increased to $\mathfrak{z}ijj$. and on the 18th of September to $\mathfrak{z}ss$.

Sept. 21. She was no better (the weather had been for some time intensely hot, and had rendered her irritable), and for some reason, I forget what, the sulphate was substituted for the subcarbonate, in doses of gr. v. three times a-day.

Oct. 2. The dose was advanced to gr. vijss., and on the 5th to gr. x.

Oct. 9. She was no better, and, being satisfied that the subcarbonate would cure her, I resumed it. She began with $\mathfrak{z}ijj$. every six hours: advanced on the 13th to $\mathfrak{z}ss$., and on the 23d the same dose was taken every four hours.

She had mended rapidly for some time, and was dismissed perfectly well on the 4th of November. The disease returned in a very slight degree, but yielded permanently to the medicine.

CASE VI.

Sept. 2, 1824. Mary Thornton, aged sixteen, afflicted with chorea twelve months. She was ordered $\mathfrak{z}ijj$. of the subcarbonate every six hours.

On the 18th the dose was augmented to $\frac{3}{4}$ ss., and on the 9th of October the frequency was increased to every four hours.

On the 4th of November she was dismissed, having been perfectly well some time.

CASE VII.

March 10, 1825. Isabella Leach, aged nineteen years, ill with chorea three weeks. For two years previously she had a little numbness of the arms and face, chiefly in the morning, with severe headache. These symptoms were all removed by leeches and purgatives, and she remained well for five weeks, when the chorea began, and it still increases. She cannot articulate, nor make her bed. The pulse is quick. There is occasional pain of the head and abdomen, and occasional costiveness. She menstruates regularly. Sleeps very badly.

Ordered $\frac{3}{4}$ ss. of the subcarbonate of iron every six hours.

On the 15th she had begun to sleep better, to articulate distinctly, and was less agitated. On the 23d she began to take the medicine every four hours.

On the 29th she was so far recovered as to

do needle-work : was soon after quite well, and was dismissed on the 5th of May.

CASE VIII.

May 12, 1825. Lucy Blomfield, aged fifteen years, ill with chorea seven weeks. Had it three times before, in the spring: the last time six years ago, and the two preceding springs. Right side only affected. *Headache*, but always subject to it. *Sight of right eye sometimes lost for half an hour*. Bowels regular. Has never menstruated.

She was ordered $\bar{z}$ ss. of the subcarbonate of iron every six hours.

On the 21st she was much better, and her headache was gone. She soon got well; *lost the headache entirely, and the affection of her sight*. She never required opening medicine, and was dismissed June 23.

These are *all* the cases of chorea in which I have employed the medicine, with the exception of two that continued so short a time under my care that its powers were not put to the test. But, although it has so strikingly cured all these cases in succession, I do not extol it as a specific. It may, indeed, sometimes be safely given even when

the head aches, the tongue is foul, and the bowels torpid, but the removal of blood and the use of purgatives may sometimes be the correct plan of treatment, at least in the first instance, and I, when a student, saw a young woman labouring under the disease die apoplectic. Besides, there are some cases of chorea probably connected with organic disease of the brain.

Iron has been recommended in chorea among the multitude of vegetable and mineral tonics, but I am not aware that its powers have been at all appreciated, or the possibility contemplated of giving it with advantage where there were headache, vertigo, and symptoms of a degree of paralysis. Dr. Good, the most recent and extensive of our compilers, mentions almost every remedy employed in this disease, and refers to numerous authorities, but says, "the metallic salts and oxides have been tried in every form, with apparent benefit in a few individual cases, but without any decided or general success." And in the next page, "The preparations of iron have for the most part been found too stimulant".

I have failed with the largest quantities of iron in epilepsy, cancer, and lupus, but found it very beneficial in chronic neuralgia, and various chronic ulcerations and chronic pustular diseases, as well as those diseases of debility in which it is so justly celebrated.

Whether the sulphate would answer as well as the subcarbonate in neuralgia and all other cases where the latter is beneficial, I cannot say, but the following case illustrates its use in chorea.

Oct. 2, 1823. Caroline Marks, aged four years, ill with chorea one month. Cannot walk. *Is a fat rosy-faced child.*

I prescribed $\mathfrak{ij}$. of the subcarbonate of iron every six hours, but, on account of her plethoric state, four leeches also to the temples, on the day of admission and the subsequent day; and on the 3d and 4th she took gr. iv. of the submuriate of mercury. On the 7th she could walk, but, on account of the difficulty of making her swallow physic, the doses were now ordered every eight hours only, and increased to $\mathfrak{zss}$. Scammony and submuriate of mercury were likewise directed to be taken when necessary. This, however, seldom happened.

On the 14th she was worse, but had generally refused to take her medicine. I therefore substituted the sulphate, and prescribed gr. iij. three times a-day.

On the 18th she was much better, and the bowels had been so regular that she had but once required the cathartic. On the 21st she was free from disease, and dismissed with a supply of the sulphate for a fortnight.