

three times a day, very soon removes the disorder.

Hatton Street,
May 10, 1786.

XV. *Medical Reports of the Effects of Arsenic in the Cure of Agues, Remitting Fevers, and periodic Head-Achs.* By Thomas Fowler, M. D. Physician to the General Infirmary of the County of Stafford. Together with a Letter from Dr. Arnold, of Leicester, and another from Dr. Withering, describing their Experience of the Effects of Arsenic in the Cure of Intermittents. 8vo. Johnson, London, 1786.

FOR more than a century past arsenic has been occasionally recommended by different writers in the cure of intermittents; but the generality of physicians have hitherto been unwilling to adopt so hazardous and suspicious a remedy in a disease which is not often fatal, and for which we have a specific of so much certainty and safety as the Peruvian bark; to say nothing of a variety of other remedies, which are often successfully administered, either separately, or combined with the bark, in
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such cases. — It is probable too, that the large and dangerous doses, of three, four, and even five grains *, in which it appears formerly to have been administered, may have deterred them from making use of a medicine which, in such doses, could hardly fail to produce the most alarming effects.

Wepfer, who had been instructed in the use of an arsenical decoction of great efficacy in fevers, did not think it prudent to communicate the manner of preparing it to the public †; and Lentilius, who mentions the great success of a physician at Coppingen with a similar preparation, which is described as infallible in every species of intermittent, the quartan not excepted ‡, very cautiously adds, that he him-

* These doses we find mentioned by different writers; but in the *Miscell. Curios.* (Dec. 2, ann. 5.) we meet with the formula of a fever powder, each dose of which contains only about a quarter of a grain of arsenic. Even this, however, must be considered as a dangerous dose.

† *Nollem illam publici juris fieri, ne imperitis aut temerariis nocendi ansam darem, eoque magis cum tot febrifuga tutiora et efficaciora habeantur.* — *Wepfer de Cicuta Aquatica*, cap. 20, hist. 13, schol. 3.

‡ *Tollit omnes intermittentes, ipsamque adeo quartanam.* — *Misc. Cur. Acad. Nat. Cur.* Dec. 2, ann. 3. Obs. 46. 4to. Norimbergæ, 1685.

self preferred a slower, but safer method of cure*. Friccius, however, who had repeatedly experienced the efficacy of arsenic, and who was a zealous friend to the medical use of poisons in general, in a learned and curious work †, published at the beginning of the present century, not only asserts, that, in the cure of intermittents, the effects of arsenic are as certain as those of the Peruvian ‡ bark, but contends that it possesses all the properties which are wont to be ascribed to the best remedies, and that it never deceives the expectation either of

* Ego alia methodo intermittentes feliciter abigere didici, tardiori licet, atqui tutiori; nolim hanc imitari. — Misc. Cur. Dec. 2, ann. 3. Obs. 46.

† Melchioris Friccii, Medici Ulmenfis, Tractatus medicus de virtute venenorum medica; in quo paradoxologice et contra communem medicorum opinionem experimentis, rationibus, et celeberrimorum in arte medica virorum auctoritatibus probatur, venena interne et externe usurpata non esse noxia, sed præstantissima remedia, et in morbis desperatis, ut lue venereâ, leprâ, manîâ, epilepsia, febribus quartanis, &c. ultimum medicorum et ægrotorum refugium, et eorum correctiones et præparaciones ut plurimum esse superfluas et inutiles, simulque cujusque veneni antidotum ostenditur. 8vo. Ulmæ, 1701.

‡ Paroxysmi ab ejus (arsenic) usu tam certo profligati, quam certo decantatissimum corticem Chin-de China, alias Peruvianum appellatum, eos profligare, quotidie experimur. — Friccius, de virt. venen. med. Cap. de Arsenico.

the physician or patient*. Notwithstanding this eulogium, however, and the praises bestowed on it about the same time by Slevogtius †, who has mentioned his successful administration of it in fifty cases, its use for many years past, as a remedy for fevers, seems to have been confined almost entirely to empirical practice.—Newman, in his chemistry, speaks of a specific febrifuge, as it was called, which was sold at Berlin and other places, and was said to be a preparation of arsenic; and in this country a medicine of a similar nature has for several years past been advertised under the title of the tasteless ague and fever drops. These drops having been successfully employed in the coun-

* *Experientia nos docebit arsenicum in febribus intermittentibus exhibitum omnes eas dotes possidere, quibus optima remedia prædita esse debent. Non enim solum cito effectum suum in morbum exserit, una vel altera exhibitione statim paroxysmum febrilem protelando, non solum tuto operatur, nullum periculosum symptoma excitando, vel morbosam corpori indispositionem relinquendo; neque solum jucundè curat, quia in restrictissima dosi sumitur, omnis odoris et saporis molestiæ expers est, atque ideo citra nauseam ingeritur; sed etiam et quod maximum, remedium est certum, et quod desiderium ægrotantis, vorumque medici nunquam fallit.—Ibid. p. 36.*

† *Propempticon Inaugurale de permissione prohibitorum et prohibitionem permissorum. — 4to. Jenæ, 1700.*

ty infirmary at Stafford, and found by Mr. Hughes, the apothecary to the infirmary, to be a preparation of arsenic, Dr. Fowler dissolved a small portion of white arsenic in a solution of the fixed vegetable alkali, and, on trying and comparing the effects of this solution with those of the patent ague drops, he found the two medicines to be similar, but that the former was too strong: he therefore diluted the solution by doubling the proportion of water, and then comparing the effects of the two medicines, found them to be nearly of equal strength.

Having thus become acquainted with what he esteemed a powerful medicine, he administered it in a great number of cases, and now communicates his experiments and observations on this subject to the public, relating, with great candour, all the instances of failure, as well as success, that have occurred to him in the course of its administration.

The medicine employed by the author is prepared by dissolving sixty-four grains of white arsenic, finely powdered, and the same quantity of a pure fixed vegetable alkali (or, instead of the alkali, a double proportion of purified nitre) in half a pint of common distilled water,
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in a proper vessel, placed in a sand bath, the water being suffered to boil gently till the solution is complete. To this solution, when cold, are added half an ounce of compound spirit of lavender, and a sufficient quantity of common distilled water, to make the exact weight of the solution fifteen ounces and a half Troy weight.

Eighty drops (or one drachm) of the solution, thus prepared, contain about half a grain of arsenic; and Dr. Fowler has administered it to adults with considerable latitude, from ten drops twice a day to more than double that number thrice a day: but although large doses of it, exhibited three times a day, and with short intermissions, are found to be more efficacious than small ones given twice a day, and with long intervals, yet he very prudently gives the preference to moderate doses, as these, he observes, are sufficiently successful, and their effects by no means so troublesome and distressing to the patient as those of larger ones. Twelve drops Dr. Fowler considers as a medium dose for adults; but he does not confine its use to this period of life, having administered it with success to children under two years of age. In general, however, he observes, it ought not to be had recourse to at so early an age, unless

the failure of other medicines, or the circumstance of its being tasteless, and therefore more easily administered, should render its use advisable; but, even in such cases, he cautions us not to persist in it, if its effects become troublesome. — The dose for children, from two to four years old, varies from two to five drops; but, for the sake of a more accurate measurement of the doses for children under five years of age, we are directed to add an ounce of common distilled water to an ounce of the solution, in order to form a milder preparation, of which ten drops (being equivalent to five of the former) will be a dose for a boy of five years old.

The solution, when given in small doses, will, in general, we are told, be attended with no operation. Sometimes, however, it will occasion nausea and griping; but these effects, the author observes, seldom increase to vomiting or purging, unless large doses of the medicine are employed; and, he assures us, they may frequently be obviated, and the administration of the solution successfully continued, by the assistance of small doses of laudanum.

Certain swellings, especially of the face, or a loss of appetite, have been observed by the
author

author sometimes to attend the larger doses of the solution, and now and then even the smaller ones.

In several instances, he observes, it has proved diuretic, while, in two or three others, it has seemed to diminish the natural urinary discharge. In a few cases it has occasioned an uneasiness and pain at the stomach, or a slight general eruption like the nettle rash; and in a very few instances he has seen it produce a sweat, a head-ach, or slight tremors. These effects, however, whether separately or collectively considered, have been so few and contingent, that they ought not, he thinks, to be deemed any part of the ordinary operation of the medicine.

The cases in which Dr. Fowler has administered the solution, and of which he gives an account, are divided into sections, in order that the cases which resemble each other in their nature, treatment, or event, and also the observations more immediately connected with each particular part of the subject, may appear in a more clear and practical point of view.

The first section contains fifty-two cases of agues, the greater part of them tertians, successfully treated by the solution. In these

cases, the author's usual method is to give the solution three times a day, in a dose suited to the age of the patient, for five days; at the end of which time, if the fits, as, he assures us, most commonly happens, are suspended, he omits the use of the medicine for two or three days, and then repeats it three days more, in order to prevent a relapse. This is his general direction relative to the use of the solution in the treatment of agues;—for the exceptions to it, which different circumstances may require, we must refer our readers to the work itself.

The second section contains twelve cases of agues, which, after failure by the solution, were cured by the assistance of the bark.

In the third section are related six cases of agues, in which the solution failed to cure the disease. In all of these cases the failure is ascribed to the irregular attendance of the patients.

The fourth and fifth sections contain sixteen cases of remitting fevers, and seven of periodic head aches, in which the solution is said to have been productive of the same good effect as in agues.

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The cases which are the subjects of the first, second, and third sections, are only a part of the instances of agues in which the author has made trial of the solution; but to shew that they have been collected as a just specimen of the practice he recommends, he has given, in the form of a table, a view of the curative effects of the solution in all the cases of agues in which he has tried it. From this table it appears, that, of two hundred and forty such cases, one hundred and seventy-one were completely cured by the solution; that forty-five were cured by the Peruvian bark, after failure by the solution; and that in twenty-four of the cases it proved unsuccessful, which the author attributes to a partial administration of the medicine, occasioned by the irregular attendance of the patient.

The letters to the author from Dr. Arnold and Dr. Withering contain additional proofs of the efficacy of the solution in the cure of intermittents. The former of these physicians, as we learn from his letter, has tried it in about eighty such cases, quotidians, tertians, and quartans, and has seldom known it fail of success. In a few instances he has seen reason to lay it aside, and to trust the cure to the red
bark,

bark, which has succeeded; but the solution has, he believes, succeeded in as many instances, when the red bark has failed; and in no case has he been sensible that it produced any permanent ill effect. From Dr. Withering's letter we find, that, of forty-eight patients, thirty-three were cured by the use of the solution alone; three complained of pain in the stomach, loss of appetite, and had swollen faces; but their fevers, it seems, were cured, and a little soluble tartar removed the symptoms now mentioned: the other twelve, we are told, received no benefit. Dr. Withering is convinced, that, in cases where great debility has prevailed, either from old age or other causes, and where the recurrence of the fever, under the quotidian form, with the long protraction of the paroxysms, and the great irritability of the stomach, have not allowed a sufficient quantity of bark to be given, he has seen the existence of the patients preserved by the use of arsenic. In the course of his letter, Dr. Withering mentions, that Mr. Freer, jun. surgeon at Birmingham, has given it to more than a thousand patients, without either hazard or inconvenience. — It may be proper to observe, that, in the solution employed by Dr. Arnold and
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Dr. Withering in their experiments, the proportion of arsenic was smaller than in Dr. Fowler's solution, and that the medium dose for an adult, used by Dr. Arnold, was equal only to about nine, and that employed by Dr. Withering to seven drops of Dr. Fowler's medicine.

Of the effects of this medicine, we can say nothing from our own experience; but a judicious and experienced practitioner, who, on the authority of M. le Febure*, tried its effects in cancers, and who has likewise administered it in agues and some other diseases, assures us, that, in many of the cases, though given in so minute a dose as the sixteenth part of a grain, its effects were so troublesome, that he was obliged to discontinue it; and that he was never able to extend the dose of it, in any case, beyond a quarter of a grain.

Sir George Baker, in his valuable observations on the late intermittent fevers †, informs us, that a medicine, compounded of arsenic and opium, (the dose of which was a very few

* Remede approuvé pour guerir radicalement le Cancer occulte et manifeste ou ulcéré. 8vo. Paris, 1774.

† Medical Transactions, Vol. III. page 157.

drops in water) was taken by some of the inferior ranks of people, and sometimes successfully; but that, now and then, violent vomitings, cholick, and dysentery, were the effects of it, especially when a patient, too desirous of a compendious cure, exceeded the dose limited. The learned writer adds, that a practitioner in the county of Dorset, who bought a large quantity of this medicine, and dispensed it among his patients, observed, that it hardly ever failed to stop the fits very soon; but that the fever was apt to return, though it was as easily prevented by the same means repeated. He had reason to think, however, that it injured the constitution afterwards in several instances; so that he was, at length, deterred from the use of it; and, we are told, he saw more than one case where an ague, thus cured, was followed by a palsy of the lower extremities.

While we thus bring forward to the notice of our readers circumstances that may tend to render them cautious in the use of so active a substance, we think it right to observe, that Dr. Fowler, who contends only for its employment in what he conceives, from his experience, to be safe doses, acknowledges that it

is a medicine of too great activity to be safely administered by those who are unacquainted with the practice of physic: but, we fear, that, even in the hands of medical practitioners, arsenic, generally adopted as a substitute for the bark in the cure of intermittents, would be productive of infinite mischief; and that a remedy which is capable of exciting virulent effects in such very minute doses, and which is frequently (as we learn from Dr. Fowler's work) rendered insupportable to the patient by the variation of only the sixtieth or eightieth part of a grain, would, in many cases, be worse than the disease.

XVI. *Of Diseases, supposed to be venereal, produced by transplanted Teeth.* Vide *A Treatise on the Venereal Disease, by John Hunter.* 4to. London, 1786.

SINCE the practice of transplanting teeth has been adopted in this country, several cases have occurred in which the venereal infection has been supposed to be communicated in this way, and they have been treated accordingly; but the ingenious and respectable