AN ANALYTICAL INQUIRY INTO THE CAUSES OF THE PROSCRIPTION OF TOBACCO IN CASES OF ASPHYXIA.

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A NUMBER of years has now elapsed, since the Royal Humane Society of London issued their decree, proscribing the use of tobacco, in all shapes, as part of the resuscitative process in cases of drowning. This example has lately been followed by a similar society in Hamburg; the opinions as to the accuracy of this proscription are, up to the present time, divided in France; and Holland, the country to which we are indebted for the first regular organization of an establishment for the recovery of those drowned, or otherwise apparently dead, still maintains its original views regarding the efficacy of this plant in such cases.

The objects of this paper are, to investigate analytically the causes of this diversity of opinion; to lay before my medical brethren, as it were, a bird's-eye view of the principal experiments, theories, and practical experiences which have, from time to time, been handed down to us by our predecessors; to inquire, as closely as the pages of a journal will allow, into the correctness of some of the theories which have been advanced; and to see how far these can be reconciled to past practice. This, however, is a more difficult task than may at first sight appear; for I shall have to contend not only against opinions which have for a long time been regarded as infallible, but also against views which have been propagated by individuals who have, in more departments than one, enriched science by their discoveries and deep research. It is, indeed, no easy matter to decide when "doctors differ;" for while, on the one hand, some eminent men regard tobacco as a deleterious agent, others again, of no less illustrious name, look upon it, provided it be administered in a proper and cautious manner, not only as a beneficial, but also as the most powerful remedy in the cases above mentioned. In the list of the former, we shall find the names of Hunter, Coleman, Portal, Brodie, Orfila, &c. enrolled; in that of the latter, those of Pott, Stoll, Cullen, Pia, Hawes, Froderé, &c. The first-named individuals base their opinions upon theory, deduced from experiments performed on the lower animals; the others, upon the cases in which tobacco has been successfully employed. The cause of this discrepancy of opinion may, I think, be traced to the commonly received opinions of the properties of tobacco. The description generally given by writers is, that it is narcotico-acrid, acting, when used medicinally or otherwise, as a powerfully depressing agent. This is perfectly true, but it is not the whole truth. That it is a potent sedative, no one who has ever smoked tobacco will be inclined to deny; this action, however, is not the primitive but the secondary one; for, like opium, in certain doses, its primary properties are decidedly stimulating. It is on account of this peculiarity that its employment has been recommended in cases of drowning; and it is, I think, from the overlooking of this fact, and the decided preference that has been given to theory over practice, that so much

opposition has been raised against it as a remedy. One circumstance, however, is incontestable; and that is, that all the objections which have been advanced against the efficacy of tobacco injections are speculative, and rest purely on theoretical grounds; no view which has been brought forward is supported by direct proofs; while, on the other side, practical experience tells greatly in favour of tobacco, as a powerful agent in the restoration of asphyxiated individuals.

Besides, the experiments which have been performed by many writers on this subject, are not of that nature to enable us to form correct deductions. In Sir Benjamin Brodie's experiments with the infusion of tobacco, he mentions neither the strength of the infusion, nor the ages of the animals used; moreover, the results obtained do not coincide with each other. For instance, in some of the experiments, no peristaltic motions of the intestines were excited; in another, which, in my opinion, is the most interesting, they were greatly increased, and accompanied by spasms of the whole of the voluntary muscular system. As a brief outline of these experiments here may not altogether be out of place, I shall subjoin one.

Experiment 1.—Four ounces of the infusion of tobacco were thrown up the rectum of a dog; in four minutes, there was retching without vomiting; in nine minutes, the motion of the heart could not be felt; and, in ten minutes, the animal appeared dead. On opening the two great cavities, the heart was found much distended; there was no peristaltic motion of the intestines.

Experiment 2.—An ounce of very strong infusion was injected into the rectum of a cat. Death in seven minutes; symptoms similar to those in the last experiment; extreme distension of the heart.

Experiment 3.—Three ounces of infusion were injected into the rectum of a dog. Death in ten minutes; symptoms and *post-mortem* appearances, similar to those already mentioned.

Experiment 4.—Three ounces of infusion were injected into the rectum of a dog; immediate tremulous contractions of the voluntary muscles. In five minutes, the injection was repeated: sickness, vomiting, faintness, and death in ten minutes after the second injection. The heart was found extremely distended; on being scratched with the point of the scalpel, both auricles and ventricles contracted so strongly, as to restore the circulation, which, by the aid of artificial respiration, was kept up for more than half an hour.*

The fifth experiment being the most important, and the one above alluded to, I give it in full. "In a dog, whose head was removed, I kept up the circulation by means of artificial respiration. I then injected into the stomach and intestines nine ounces of the infusion of tobacco. At the time of the injection, the body of the animal lay perfectly quiet and motionless on the table; the heart acted regularly one hundred times in a minute. Ten minutes afterwards, the pulse rose to one hundred and forty in a minute; the peristaltic motion of the intestines was much increased, and the voluntary muscles, in every part of the body, were thrown into repeated and violent spasmodic action. The joints of the extremities were alternately bent and extended; the muscles of the spine, abdomen, and tail, alternately relaxed and contracted, so as to

* For more intimate information regarding these, see *Philosophical Transactions* for 1811.

turn the whole animal from one side to the other. I have observed, in other instances, spasmodic actions of the muscles, where the circulation was kept up by artificial respiration, after the removal of the head, but not at all to be compared, either in strength or frequency, with those which took place on this occasion. I made pressure on the abdominal aorta for more than a minute, so as to obstruct the circulation of the blood in the lower extremities; but the muscular contractions were not lessened in consequence. Half an hour after the injection of the infusion, the artificial respiration was discontinued. The heart continued to act, circulating dark blood; the muscular contractions continued, but gradually diminished in strength and frequency. I tied a ligature round the vessels at the base of the heart, so as to obstruct the circulation; nevertheless, the muscular contractions still continued, though less frequent and forcible than before, and some minutes elapsed before they entirely ceased. In this experiment, the disposition to contraction in the muscles was very much increased, instead of being diminished, as in those just related.

Now, these are the experiments upon which those opposed to the use of tobacco injections chiefly support their objections. It was also upon these experiments that the paragraph in the annual report of the Royal Humane Society, London, for 1812, proscribing the use of tobacco fume in cases of asphyxia, was founded; although it will be seen, that no experiments whatever with the *fume* had been instituted, and that it was the *infusion* that had been employed. The fact that combustion does, or may, materially alter, not only the chemical nature, but also the properties of a substance, was not called into account; and still more, the statement of Sir Benjamin Brodie himself, confessing his inability to devise any experiment, by which the truth or fallacy of his opinion might be put beyond the reach of doubt, seems to have escaped the attention of the drawers-up of this report.

I cannot here avoid remarking that this conclusion, on the part of the Royal Humane Society, exhibits, to say the least of it, a degree of inconsistency which it would, perhaps, be difficult to justify; particularly if the former medical reports of their own medical men be perused, in which the virtues of tobacco, in cases of drowning, are so highly extolled. The limits prescribed by a journal preclude me from giving these a place in the present paper; copious extracts, however, will be found in a work which has, for some time, almost exclusively engaged my attention, but which is not yet in a sufficiently forward state for the press.

In Günther's report* we find the following paragraph. "The utility of tobacco injections has not been sufficiently determined. It is, therefore, better to desist from their employment, as long as signs of life are absent; and should these be present, to exhibit them only when the attending physician deems an immediate evacuation necessary." I am unable to reconcile the commencing sentence of the above paragraph with the concluding one. We are told, that the *utility of tobacco injections has not been sufficiently determined*; and yet, in the same breath, their employment is recommended

when an *immediate evacuation is deemed necessary*. To what does this amount, but an acknowledgment of the efficacy of tobacco injections in stimulating the digestive tube? I shall leave my readers to form their own conclusions regarding this extraordinary extract, and should any doubts arise concerning the fidelity of my translation, I beg to refer to page 44 of the above-quoted report. Marc* mentions a later edition, published by the Hamburg Society, in which the use of tobacco is altogether rejected, "because its utility has in no case whatever been demonstrated." I shall dismiss this assertion by stating, that in my analysis of the objections raised by M. Portal, which will be found further on, this circumstance will, perhaps, be accounted for.

Curry† finds his objections to the employment of tobacco fumigations on the following experiment performed for him by Sir Benjamin Brodie. The fumes of about three drachms of tobacco were injected into the rectum of a dog; this was accomplished in twenty-five minutes. After the first ten minutes the animal was in a dosing state, with tremulous contractions. The pulse was somewhat lower than natural. He vomited once, and, after the experiment was concluded, lay for some time quiet, and gradually recovered.

The above experiment cannot be brought to bear against the efficacy of the fumigations; for, firstly, the quantity of the plant employed was large; secondly, the stimulating stage was allowed to pass unnoticed; thirdly, the length of time that elapsed before the completion of the fumigatory process was great; and fourthly, none of the extreme effects which an *infusion*, containing the same quantity of tobacco, would have developed were manifested.

Hunter‡ feared, that the copious evacuations produced by the exhibition of the tobacco fumigations, might still more weaken the already greatly depressed powers of life. The usual accuracy and correct deductions of this celebrated man do not appear to be well displayed here; for what are the evacuations brought about by the stimulating properties of this vapour, but one of the signs of returning vital action? His apprehensions on this point do not, therefore, appear to be well founded.

The invective language which is indulged in by Coleman,§ and which he has heaped with no sparing hand upon such of his contemporaries whose opinions were favourable to the exhibition of tobacco, requires no refutation from me, this having been ably accomplished by Dr. Hawes, in the earlier reports of the Royal Humane Society, to which I refer those who may be more than superficially interested in this subject.

M. Leroy d'Etiolles, in his *Instructions sur l'Asphyxie*, although he does not completely proscribe the tobacco fumigations, is of opinion that it would be as well, taking into consideration the diversity of opinion which exists on this point, to abstain from their use until the other more generally used remedies have been ineffectually employed. He further recommends the substitution of other aromatic plants, such as sage, rosemary, lavender, wormwood, &c., in order to do away with the narcotic effects attributed to tobacco. I extremely regret that I cannot altogether subscribe

* Secours aux noyés et asphyxies.

† Observations on apparent death.

‡ Proposals for the recovery of people apparently drowned; Philos. Trans., 1776.

§ Dissertation on natural and suspended respiration.

* Geschichte und Einrichtung der Hamburgischen Rettungs-Anstalten, 1822.

to the views of this gentleman, to whom I labour under a deep debt of gratitude for a series of kindnesses and personal attention; for, were his first recommendation carried unexceptionally into effect, we should always use tobacco under very unfavourable and discouraging circumstances; and although his second advice may do very well in ordinary cases of asphyxia, yet in extreme cases I do not think that they are sufficiently stimulating, a property which is possessed in a high degree by tobacco, and a circumstance of which M. Leroy takes no particular notice.

M. Portal* ranks as one of the foremost of those who are opposed to the employment of the vapour now under consideration. He couches his objections to the use of tobacco fumigations in the following terms.

1. Because, in the greater number of the drowned persons restored to life, these fumigations were not used at all.

2. Because, in the small number of those subjected to this treatment, the greater number manifested signs of life before the fumigations were employed, which were never used alone, but in conjunction with other remedies.

3. Because the fumigations have chiefly been resorted to in the greater number of those individuals in whom the efforts to restore life proved fruitless.

In recording these, M. Portal assures us that they are the result of careful reading and examination, he having perused with great attention most of the numerous works, native as well as foreign, which had, in his day, been published. It is very far from my intention to insist on the efficacy of tobacco smoke injections in all cases of drowning, but at the same time I look in vain for conclusive argument in the objections which have been raised against their employment by M. Portal. I shall shortly dwell on these individually, subjecting each to a brief analysis, for the purpose of proving their non-validity.

1. *Because, in the greater number of the drowned persons restored to life, these fumigations were not used at all.* This is very possible, and most likely true, but can very easily be accounted for. If the reports of any humane society be consulted, and the particulars of the treatment and time of the submersion, or rather immersion, examined, it will be found that the *greater number* of those restored to life required no treatment beyond a glass of brandy and having their clothes dried. This objection, therefore, appears to me to be wanting in proper value.

2. *Because, in the small number of those subjected to this treatment, the greater number manifested signs of life before the fumigations were employed, which were never used alone, but in conjunction with other remedies.* I cannot, and I believe no one else can, find the prejudicial effects of tobacco smoke demonstrated, either because signs of life were manifested before its employment, or because other remedies were at the same time resorted to. Were this objection admitted, it could, with the greatest justice, be applied to all the other remedies; for no serious case of drowning has ever occurred in which one remedy alone was trusted to. Cases, however, are not wanting, and a few of those will be cited farther on, in which all the other remedies had been employed without success; and it was

not until *after* the injection of tobacco smoke that signs of returning animation appeared. I am perfectly willing to admit, in order to save argument, that the administration of the previously used remedies might, perhaps, have prepared the system, and rendered it more susceptible of the action of the gas, but am far from subscribing to the belief of its total inefficacy, or, as some have it, destructive effects.

3. *Because the fumigations have chiefly been resorted to, in the greater number of those individuals in whom the efforts to restore life proved fruitless.* It is true, that in France and Holland tobacco smoke injections have been employed in the greater number of the individuals above referred to; but this objection, like the foregoing one, applies equally to all the other remedies. If we inquire a little more minutely into the circumstances under which this elastic fluid has been used, we shall find that, in the majority of cases, the time of submersion has been considerable, the other remedies strenuously but fruitlessly employed, and the tobacco flown to as a last resort, a forlorn hope. Is it then wonderful, that in such cases its application should have proved fruitless? Is it just, is it liberal to judge of the properties of any substance under such circumstances? No! Why, then, single out this remedy? why multiply objection upon objection to its use? Has it ever been proved that, in cases of asphyxia by submersion, this plant has produced such fatal consequences as those brought about by the use of the lancet or the bellows? for it cannot be denied that many asphyxiated individuals have perished from imprudent bleeding and rude inflation of air. I am not, as I have before remarked, an enthusiastic advocate for the indiscriminate use of tobacco, or indeed of any other substance; from what I have read and heard from undoubted authority, and also from various experimental trials, I believe it to be of service in cases of drowning. The objections which have been raised against it are, I repeat it, founded upon hypotheses merely; and although they have emanated from men towards whom I entertain a profound respect, they do not, however, extinguish the desire I have to see the tobacco smoke employed with less prejudice, and under more favourable circumstances. M. Portal has advanced another objection, which I shall briefly notice, and as briefly dismiss. He tells us that the injection of the vapour, causing distension of the intestinal canal, is apt to press the diaphragm upwards towards the chest, compress the lungs, and thus oppose the accomplishment of respiration. But this objection is, as M. Marc very justly observes, too mechanical; and besides, those cases of asphyxia in which the intestinal canal suffers itself to be dilated to such a degree as to press upon the lungs and prevent respiration, demonstrate to us a want of vital reaction, under which circumstances one and all of our remedies will prove unavailing, seeing that we can hardly count upon a remnant of life.

Having now passed in review the various opinions of the writers opposed to the employment of tobacco in cases of drowning, I should proceed, preserving the same order, to state the grounds upon which those who are in favour of it advocate its exhibition. The principal of these having already been quoted in meeting the above objections, such a proceeding is unnecessary, as it would prove but a useless repetition. There

* Observations sur les vapeurs méphitiques.

are points, however, that have not been mentioned, which require a particular notice, and it is to these that I shall confine myself on the present occasion. The length which this paper has already reached precludes me from entering into the favourable theoretical opinions in as minute a manner as I could have wished, and compels me to refer those desirous of more particulars, to the respective publications. Those which may be read with interest are, Cullen's *Letter to Lord Cathcart*; Fodere's article, *Noyés*, in the *Dictionnaire des Sciences Médicales*; the *Amsterdam Memoirs*; the *Paris Memoirs*, by Pia, and Hawes and others, in the earlier *Reports of the Royal Humane Society, London*. I shall therefore notice but practical facts, and a few rather remarkable cases, leaving theory almost entirely out of the question. If I were to bring forward all the cases in which the employment of the smoke of tobacco has evidently been the cause of the first appearances of returning life, this paper would occupy a much greater space than the valuable journal of which it necessarily forms but a small part. Four or five briefly-related examples, occurring in widely-separated large cities, will, I trust, be sufficient to prove beyond a doubt, that it has not only been efficacious in practice, but, also, that the return of life was chiefly, and in some cases *solely*, owing to its exhibition. Numerous other examples will be found in the works from which these have been taken, the titles of which I have noted at the end of each case.

CASE I.—At Amsterdam, an old woman was taken out of the *Rakin*, a deep canal, in which she had been immersed a considerable time; she was supposed dead, and was about to be carried away, when Sybrand Yserman, a skipper of Gouda, who had read the Society's advertisement, believing that tobacco smoke might recover her, made the trial with a lighted pipe he had in his mouth. After the introduction of the smoke of two pipes full of tobacco, she manifested signs of life, was then carried home, and ultimately recovered.—*Amsterdam Memoirs*.

CASE II.—At Paris, a boy named Jean Baptiste Quidet, aged eight years, fell into six or seven feet of water, and was taken out after a quarter of an hour's submersion. M. Dufour, who was the surgeon sent for, successively employed the usual remedies, which were not followed by any good result whatever. The fumigatory apparatus was now used, which restored the child to consciousness; after which, a teaspoonful of camphorated alcohol was administered, which induced the vomiting of a considerable quantity of water tinged with blood. This evacuation was followed by another, bilious in appearance; and an hour's further treatment proved sufficient for the recovery of this patient.—*Pia, Detail des succès de l'établissement que la ville de Paris a fait en faveur des personnes noyées*.

CASE III.—A boy, aged ten years, playing on the banks of the Rhone at Lyons, fell into the river and disappeared: he was carried off by the strong current about four hundred paces. The accident was perceived by two fishermen, who plunging in after him, succeeded in rescuing the child, and carried him to La Charité. By the time that they arrived there, nearly three quarters

of an hour from the time of his immersion had elapsed. M. Grandchamp, the hospital surgeon, directed the resuscitating remedies. When this gentleman first saw him, the eyes were open and fixed, projecting and looking inflamed; the countenance was swollen, and of a violet colour. His clothes were instantly removed; he was dried, and enveloped in warm flannel; the jugular vein was opened by one assistant, whilst another employed general frictions with cloths soaked in warm wine. Two teaspoonfuls of antimonial wine were now administered, and the volatile alkali applied to the nose, but without effect. The fumigatory apparatus was now called into requisition, which *immediately* induced respiration and copious vomiting. The former remedies were again had recourse to, and were followed by recovery. In two days the child was restored to his parents in perfect health.—*Pia, Op. Cit.*

M. Marc, in his work, makes the following judicious remark on this case:—"Although the treatment of this child is, in some degree, objectionable, yet it proves that the inflation of tobacco smoke into the intestines, far from being injurious, proved eminently successful."

CASE IV.—Two men were drowned at Cork by a gust of wind. The accident was observed by many, but no one had courage to put off to their relief. When much time had elapsed, some men brought the bodies on shore, to all appearance dead. I went to the receiving-house where the dead persons, as they termed them, were carried. There was not the smallest respiration, or any other vital motion to be perceived. By *fumigation*, in three quarters of an hour, life returned in one; he sighed, and became universally convulsed. In about half an hour, his pulse returned, with difficult respiration, and a gradual symptom of restoration.—*Transactions of the Royal Humane Society*.

CASE V.—A child of Mr. Samuel Dashwood, jun., of Boston, aged two years, fell into a cistern of water seven feet deep, and when taken out by a gentleman of the neighbourhood, appeared dead. Fortunately, this gentleman was acquainted with the methods recommended by the Humane Society, and immediately began to put them into practice. These were persevered in, and at length he had the satisfaction to discover signs of returning life; the first symptom of recovery was a convulsive motion of the chest, attended with a forcible effort to distend the lungs. A physician arriving at this time, the pulse was examined, and though perceptible, it was extremely languid and irregular. Fumigations of tobacco were vigorously applied, and on the first injection into the bowels, a full inspiration and an evident increase of the action of the heart were produced. On suspending the use of this remedy for a minute, the vigour of the pulse was sensibly abated, and on returning to it again, the effects were as before, together with a small discharge of indigested matter from the stomach. The child was then put into a hot bed, and frictions were employed; in three or four hours he appeared to be perfectly recovered, and is now a healthy and promising child.—*Reports of the Humane Society of Massachusetts*.

The results of Copland's experiments are interesting in a high degree, as they prove the

primary action of tobacco to be stimulating. In persons unaccustomed to the use of tobacco, and who were caused to smoke this plant, he ascertained that the pulse rose after a short lapse of time; when perspiration and subsequent vomiting came on, he found that it had fallen below its original standard, which it gradually resumed some time after the cessation of the smoking. In one person, who occasionally smoked tobacco, a thrilling sensation was experienced, accompanied

by increased arterial action. The pulse rose in half an hour from 80 to 99, and, in the course of two hours, was again at the former number. I was anxious more accurately to determine the time necessary for this change of the pulse, and carefully observed the effects produced upon myself and other friends whilst smoking the plant. The following is an extract of numerous experiments, with results, and short observations.

	Before smoking the pulse stood at	After the first quarter of an hour	After the second quarter of an hour	After the third quarter of an hour	After the fourth quarter of an hour	OBSERVATIONS.
Experiment 1, on myself.	64	72	80	80	84	Accustomed to smoke occasionally; pulse assumed its original standard after the lapse of an hour.
Experiment 2, on myself.	68	80	84	80	72	Pulse in a short time after stood at 68.
Experiment 3, on Mr. F.	68	72	80	84	84	Accustomed to smoking; in less than an hour the pulse was at 70.
Experiment 4, on Mr. R.	72	78	80	80	84	Accustomed to smoking; in about an hour the pulse was again at 72.
Experiment 5, on myself.	60	78	80	78	72	In an hour, the pulse was at 64.
Experiment 6, on Mr. A. G. M.	64	In five minutes. 76	In ten minutes. 84	In fifteen minutes. 88	—	Totally unaccustomed to smoking; a feeling of nausea suddenly came on, after the first fifteen minutes, and the smoking was discontinued. After the repose of three quarters of an hour, the pulse was nearly at its former standard.

It will be observed, that the time employed in each of the above trials was an hour, excepting in the case of Mr. A. G. M., who was totally unaccustomed to smoking, and compelled to desist after the first quarter of an hour. The pulse then fell rapidly, but not below its original standard, which it resumed in about three quarters of an hour. From the above, it will be seen that, in all the cases, there was an augmented action of the heart, the increase varying from 12 to 20. I may also mention, that in no single instance, have I been disappointed in procuring the primary stimulating effect.

Testa,* although he acknowledges the primitive action of this plant to be stimulating, is opposed to its employment, on the ground that its subsequent narcotic action overbalances any early benefit that may be derived. I shall answer this objection by remarking, that in cases of suspended animation, our first duty is, if possible, to rouse the latent vital powers. No disorder, perhaps, calls more imperatively for active and decided conduct than asphyxia; delay, in such cases, is highly reprehensible; every minute that is unnecessarily lost,

* *Della morte apparente, &c.*

renders the chances of recovery more uncertain; every second that is neglected, is but a nearer approach to death. It is here that our treatment must be strictly regulated by an intimate knowledge of pathology, and the physiological action of the remedies which we exhibit. The former pressingly indicates the necessity of powerfully rousing the suspended actions of those organs which enter into the mechanism of life; and until we are put in possession of another substance, possessing the stimulating properties of tobacco, in the same degree, it is, I assert, our bounden duty to employ that plant for the sake of its beneficial effects, and leave its prejudicial ones to be combated by other well-known stimulating remedies. The fact must always be kept in view, that the impulse once given, nature herself renders invaluable and marvellous assistance, unless, indeed, the powers of life have received such serious injury as to baffle even her skill, in which case, of course, our efforts must prove unavailing.

The grounds, then, upon which the employment of tobacco fumigations are recommended in cases of asphyxia, are the following.

1st. They diffuse a genial warmth within the

interior of the body, which cannot but prove favourable in all cases.

2nd. The irritation produced by its presence, not only from its acting as a foreign body, but also through the medium of one of its properties, namely, the stimulating, excites the irritability of the intestinal tube, and re-establishes its peristaltic motions.

3rd. In cases of drowning, in which the submersion has been considerable, and the animal heat is almost entirely absent, we have no substance possessing such active properties as tobacco.

4th. If we lay aside all theoretical considerations, and draw our deductions from practical results, we shall see that there are cases in which tobacco *alone* has been used with decided success; and that in those where tobacco was employed conjointly with other remedies, it will be found difficult to determine *the* remedy which contributed the most towards the return of life.

5th. In no case whatever can any baneful effect be positively attributed to the action of tobacco fumigations.

Finally, I will remark that the conclusions condemnatory of tobacco seem to me to be rather hastily drawn. As it is neither upon theory, nor the carrying out of a favourite hobby, that the employment of any substance should be recommended, so should fanciful ideas or unfounded antipathy be deemed insufficient for rejection. Whilst an indiscriminate use of any drug is to be greatly deprecated, the opposite extreme should also be avoided. There is a middle course which should also be shunned, and that is, a wavering between these two. Many lives have been lost, in consequence of indecision; and it should always be borne in mind, that "our doubts are traitors, and make us lose the good we oft might win, by fearing to attempt."

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In the midst of a large population, or in situations where evils have been gradually and almost imperceptibly introduced, it is scarcely possible either to estimate with any certainty their extent, or to arrive at just conclusions respecting their effects. For the elucidation of many of these, investigations carried on in smaller communities are better fitted; and although, as a general principle, it may require accumulated observations, or observations carried on for a considerable period of time, or over a wide extent of country, to rectify errors, and reduce the variations arising

therefrom within the limits of calculation, the presence of disturbing causes is more commonly rendered manifest under the opposite circumstances. There can be no question in the mind of any intelligent person, but that the practices of ignorant and designing persons upon the health of the community must prove fatally injurious. The mischief, however, in the more populous places to which unprincipled persons of this description commonly resort, has usually grown with the growth of the population, and becomes from that cause inappreciable, or is lost in the very mass of the general facts accumulated, or counterbalanced and concealed by complication with other influences. Under such circumstances, observations collected in a less populous locality, and expressly in relation to the point under investigation, become of great value. In this manner, the evil, whatever it may be, becomes in a measure isolated, and is much more likely to be traced in its effects, than could otherwise be done.

The researches of Dr. Cartwright into the fatal effects of empiricism among the population of Natchez, to which we alluded in our last number, are strongly illustrative of the preceding remarks. Natchez is a town in the state of Mississippi, and, as it appears from the statements of Dr. Cartwright, possessed during the ten years 1824 to 1833 inclusive, an average population of 3000 individuals. The total deaths in this period amounted to 978, giving an annual mortality of 1 in 30.6. It seems that, during this period, strict laws were in force in that state against quacks and empiricism of all kinds.

Upon the relaxation of these laws in the course of the year 1833, a host of empirics made their way to Natchez, and used every means to destroy the confidence of the public, both in their medical advisers, and in the remedies which had hitherto been employed in the treatment of their diseases. All those artifices which are generally had recourse to by these unprincipled pretenders, and with which we, in this highly-civilized country, are by miserable experience so well acquainted, were put in requisition. The natural and unavoidable effects of age, debility, or incurable disease, were ascribed to the employment of certain methods of treatment; the secret nostrums of the quack were highly vaunted; the cures, real or pretended, which took place under their exhibition, were advertised, and every means taken which interested and unprincipled activity could devise, for the attainment of the fraudulent ends of those engaged in this wretched and murderous system of imposture.

The rate of mortality of the town, previous to the introduction of these practices, has been