

Studies, chiefly clinical, in the non-emetic use of ipecacuanha : with a contribution to the therapeusis of cholera / by Alfred A. Woodhull.

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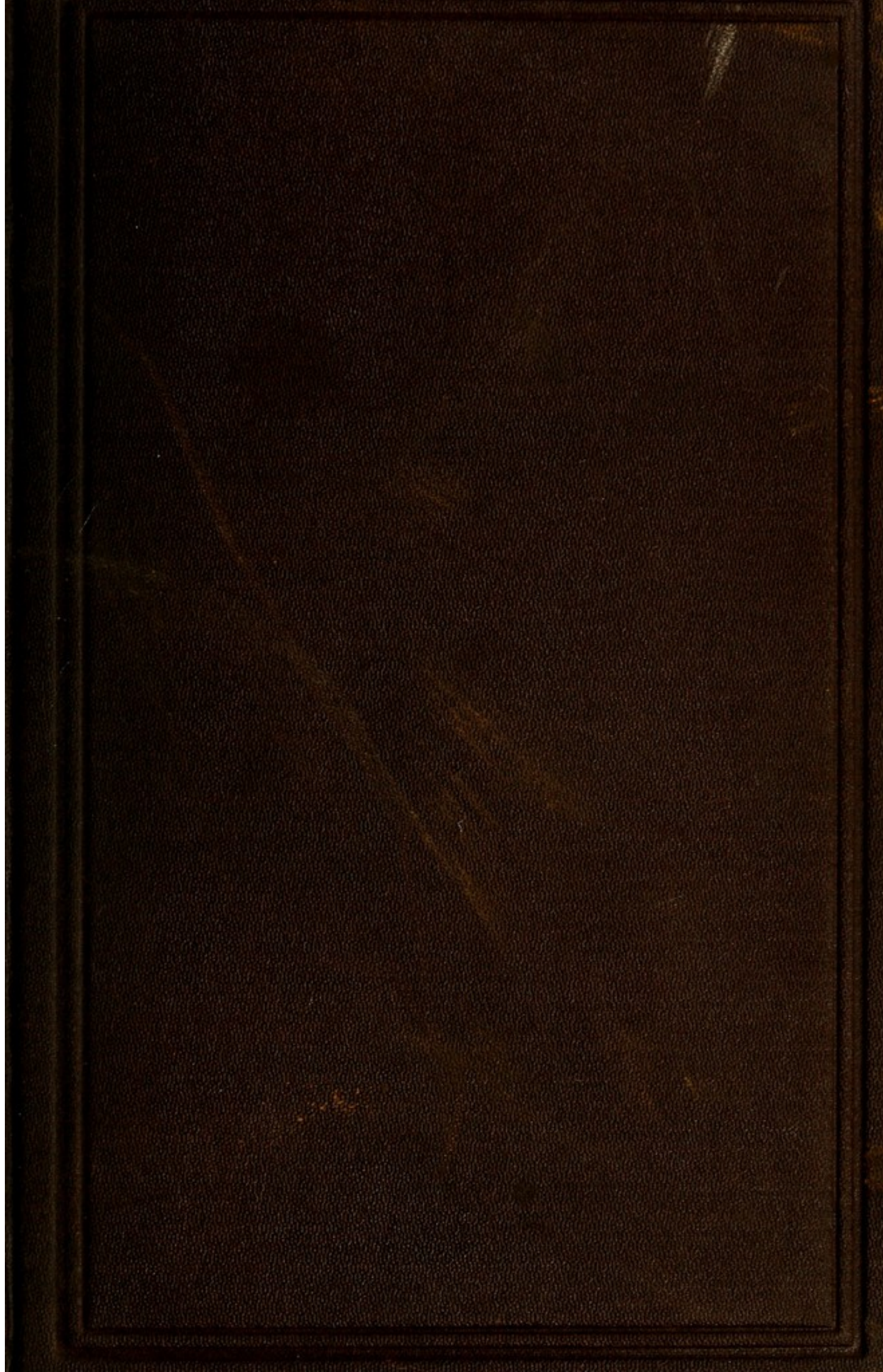
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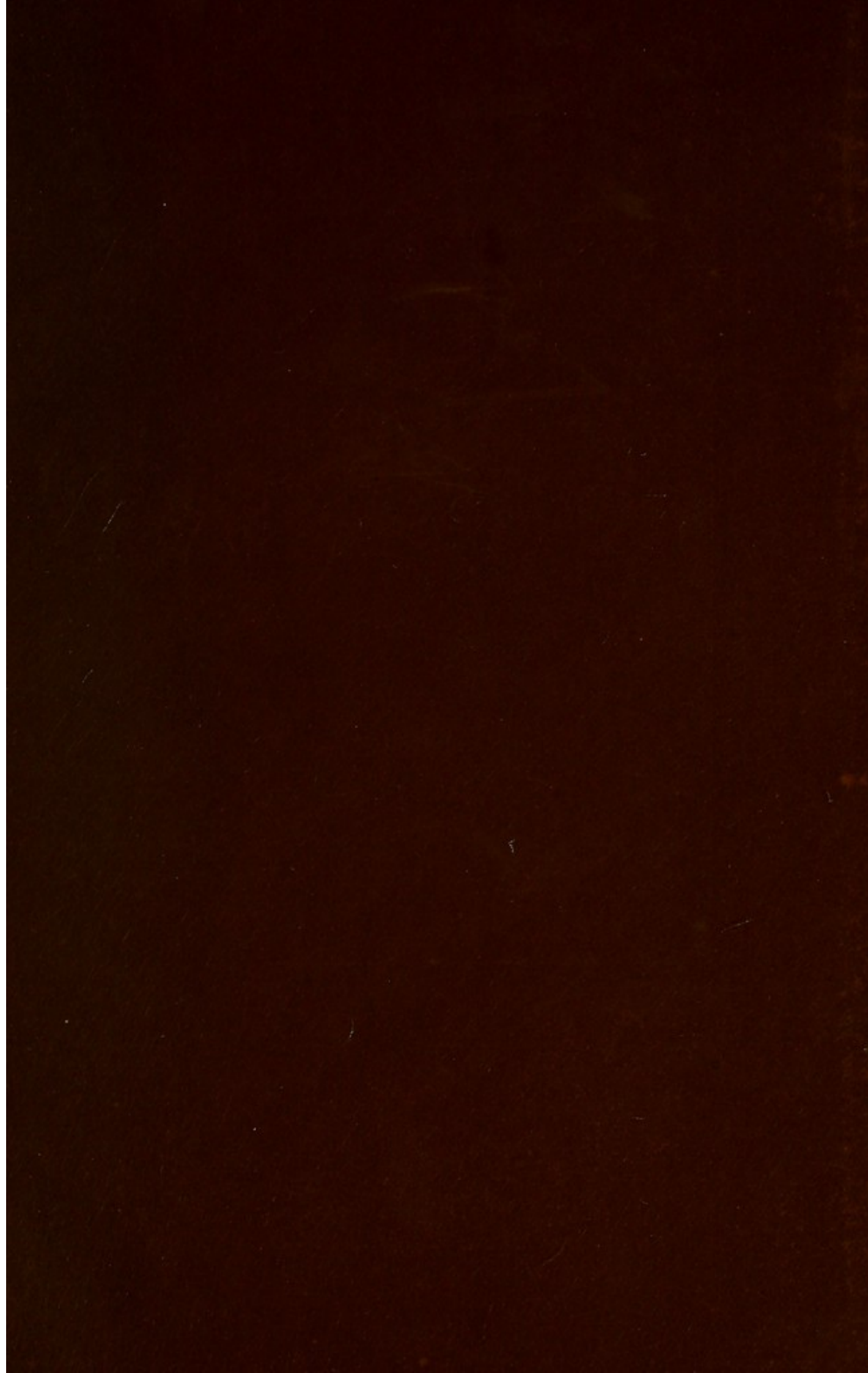


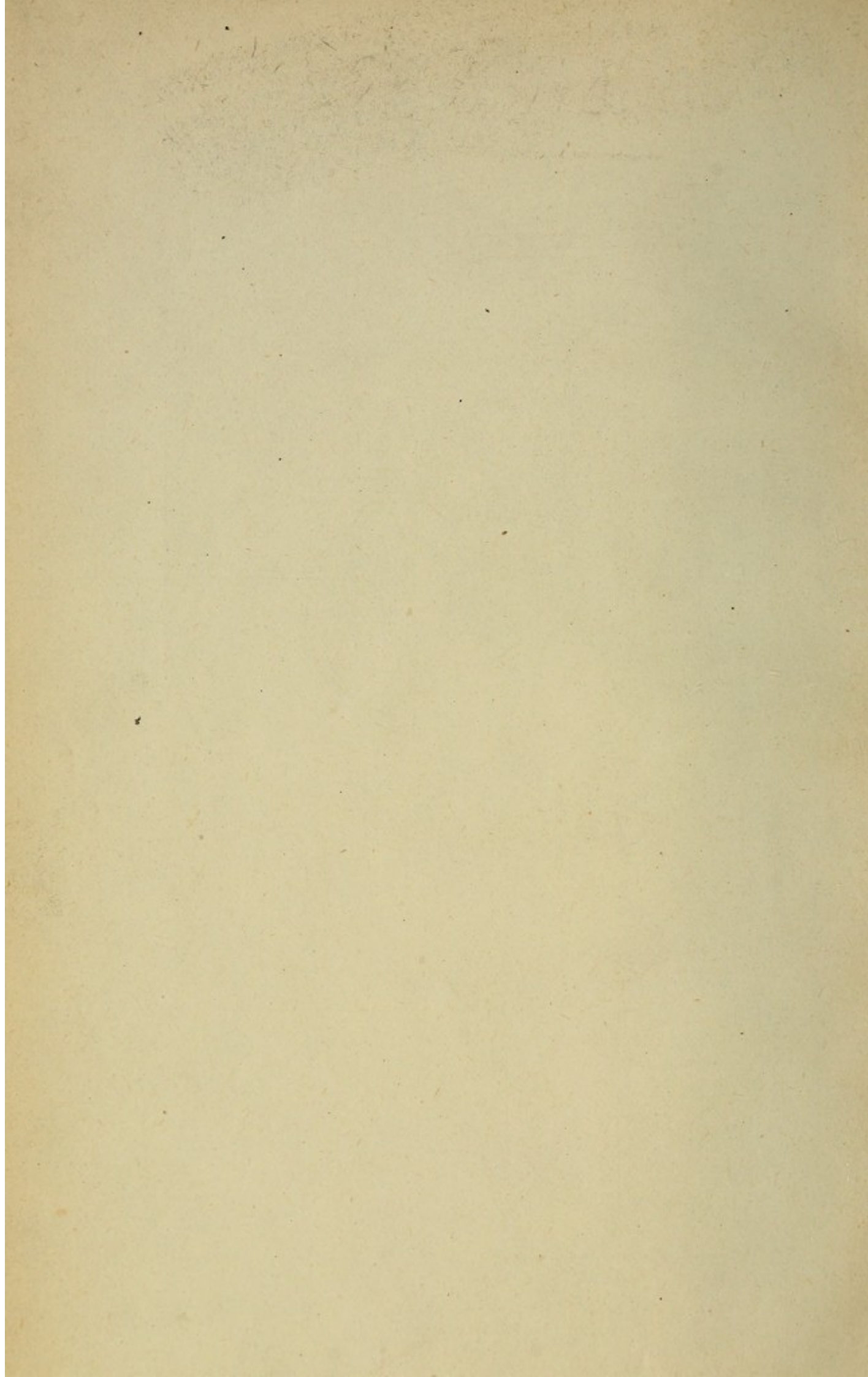
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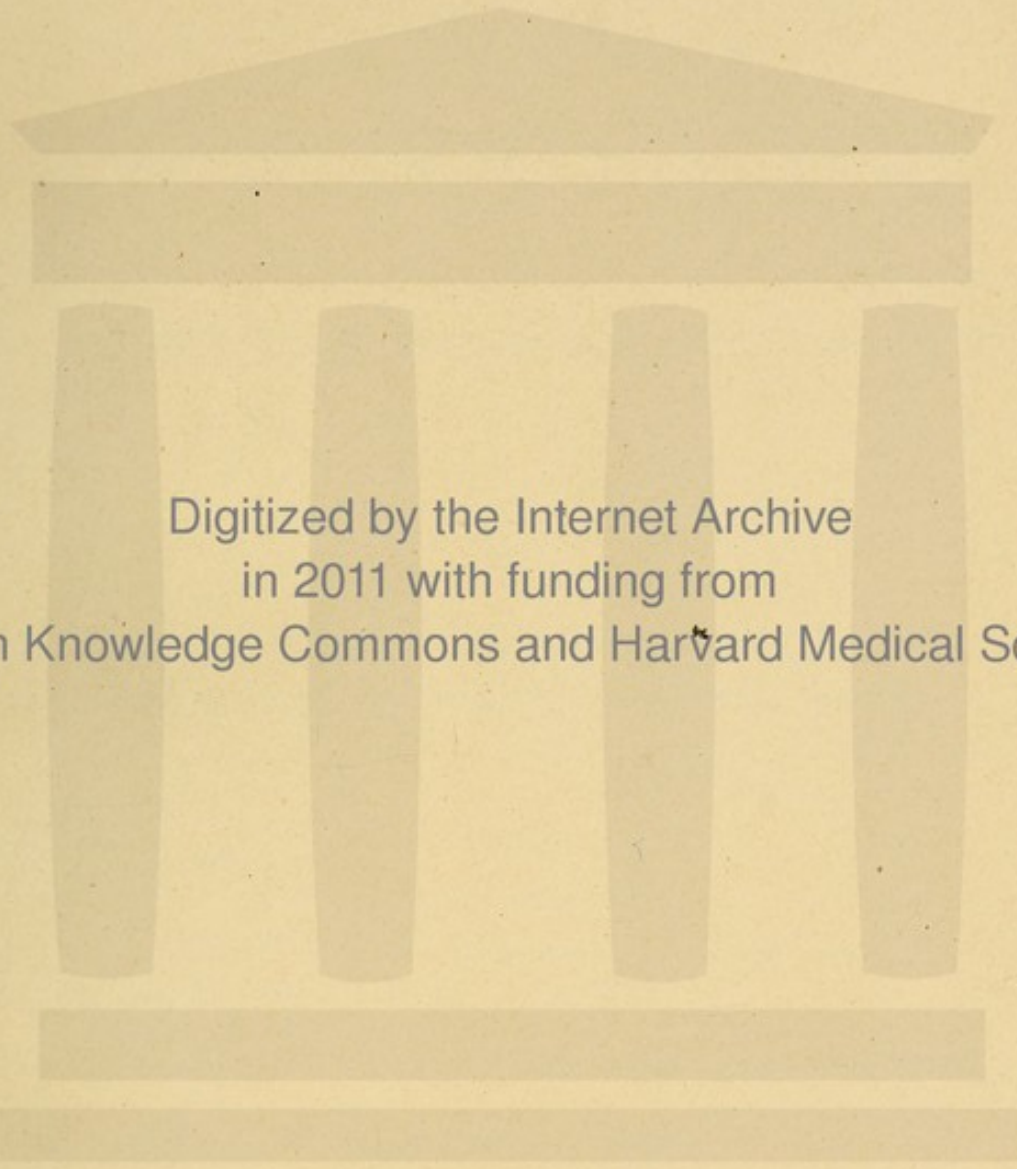
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STUDIES, CHIEFLY CLINICAL,
IN THE
NON-EMETIC USE
OF
IPECACUANHA:

WITH A CONTRIBUTION TO THE THERAPEUSIS OF CHOLERA.

BY

ALFRED A. WOODHULL, M.D.,

ASSISTANT SURGEON AND BREVET LIEUTENANT COLONEL U. S. ARMY.

But it is well remarked in Plato's Timæus that vomits and purges are the worst exercise in the world.—BP. BERKELEY, *Siris*, § 67.

When the improbability of a fact is the chief objection to the belief in its reality, the evidence which attests it regains all its value, if the improbability be proved only apparent.—SALVERTE: *Philosophy of Magic*, Preface.

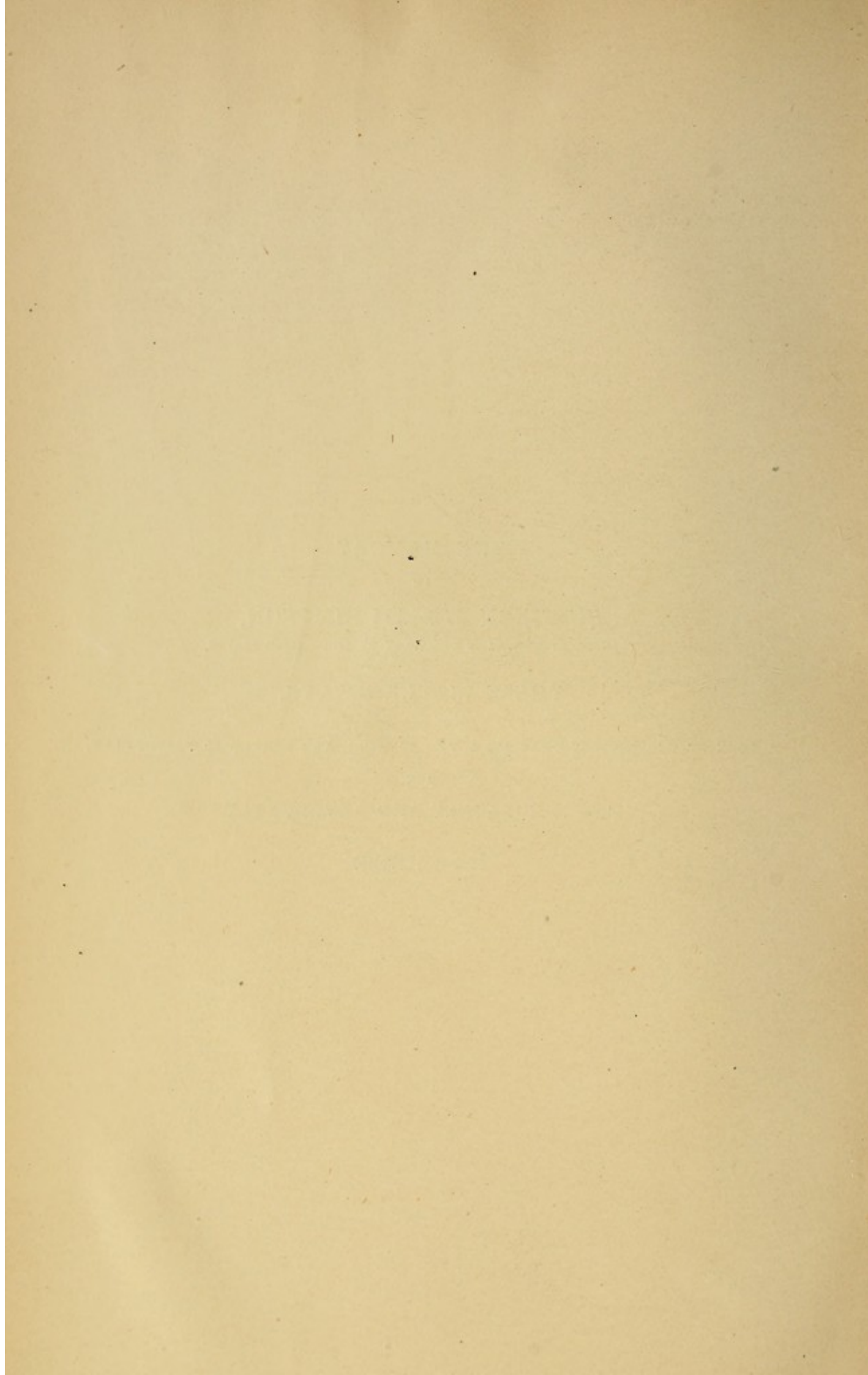
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TO
THE MEMORY
OF
SURGEON JOSIAH SIMPSON,
COLONEL BY BREVET IN THE ARMY OF THE UNITED STATES,
THESE LITTLE ESSAYS,
BORN OF THE SERVICE THAT HE LOVED SO WELL AND SERVED SO FAITHFULLY,
ARE
AFFECTIONATELY AND REVERENTLY
INSCRIBED.



PREFACE.

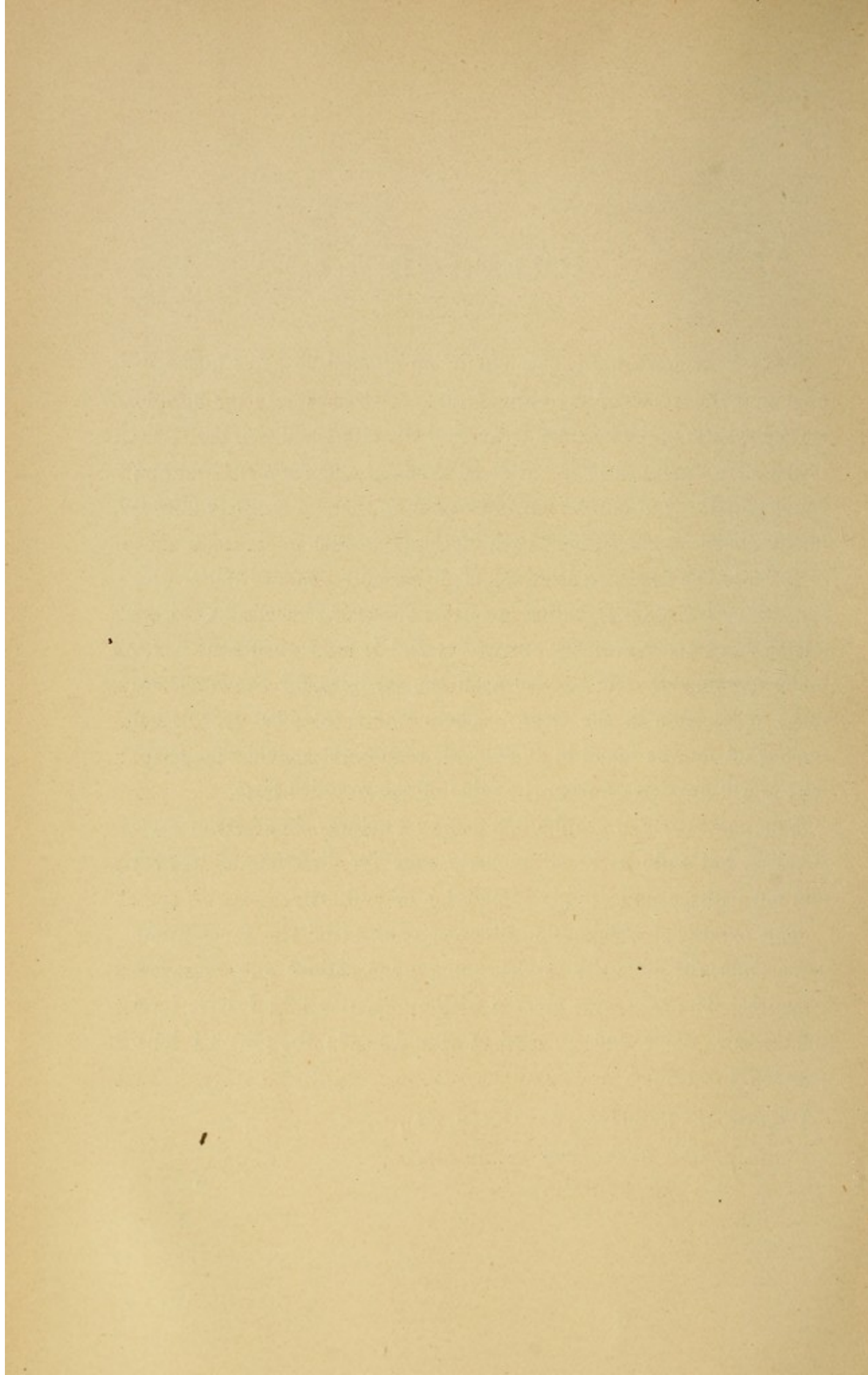
THIS little work has grown out of an attempt to solve questions arising in the course of my ordinary duty. Originally in the form of special reports to the Surgeon General of the Army and afterward published with additions in the *Atlanta Medical and Surgical Journal*, the material and argument have increased so that I venture to offer it in this shape for the consideration of the profession.

It is, in chief part, an itinerary of an actually travelled route, with suggestions for the explanation of certain observed phenomena, written out to assist other ordinary travellers; and is not a complete survey, much less an elaborate treatise upon the territory, for the entertainment of students in the closet. There is one extended speculation upon what may be found in an adjacent region, but should that prove false it will not detract from the value of the recorded facts.

I do not scruple to use the first person wherever simplicity of style requires, but I do so in all modesty only for directness of speech and not with an unbecoming assumption of authority.

The occasional reference to different editions of the same works arose from the necessity of depending upon various and imperfect libraries. The references marked with an asterisk [*] I have been unable to examine, and are used at second hand; the others I have personally consulted.

OGLETHORPE BARRACKS, SAVANNAH, GA.,
15th April, 1876.



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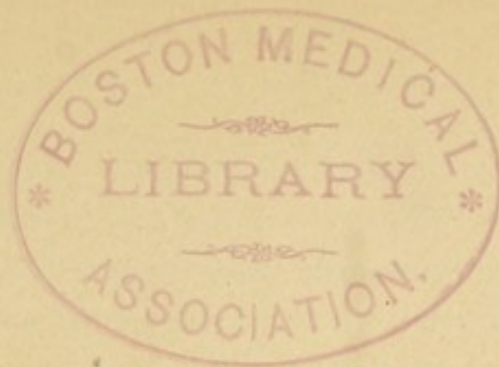
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STUDIES WITH IPECACUANHA.

THESIS AND OUTLINE.

THE prominent place among the emetics assigned to ipecacuanha in systematic works on therapeutics, indicates the ordinary estimate placed upon the drug. That it has other important qualities which this more obvious attribute has in great measure masked, and that it is a direct nervous stimulant, acting chiefly if not entirely upon the sympathetic system, is the thesis that it is proposed to maintain. There is nothing self-contradictory in such a supposition, and were a new remedy announced with these characteristics its claim to consideration would not be denied. But ipecacuanha is weighted with an apparently irreconcilable record, and preconceived notions must be temporarily laid aside by those who would fairly discuss the proposition. Should the facts and arguments presented fail to establish that it is a nervous stimulant, which in excessive or inopportune doses acts as an innocent emetic, the popular views may readily be resumed.

The following plan has been followed. A large amount of clinical material, some that is novel and a part corroborating, and a part compiled from, the recorded experience of others, has been collected as to the experimental use of ipecacuanha in a number of serious affections. These illustrate the possession by that drug of peculiar powers that are not generally appreciated. It is then attempted to correlate all the clinical facts and to offer an hypothesis, broad enough to cover the apparently antagonistic conditions and to reconcile some seeming discrepancies, which may lead us a step further in therapeutics. This may expose to the charge of presumption and of being carried away by untenable speculations: but the cases and the statements have been

carefully selected as those of competent observers, are believed to be authentic, and are fully exposed for critical inspection. Deductions from them are clearly matters for argument, and it is by honest discussions of this sort that we may hope for the advancement of medical science. If the views set forth differ too widely from some commonly taught, I beg for them, on that account, so much the more careful reading and a suspension of judgment until the essay can be considered as a whole. For what appears opaque in a partial light may be translucent under fuller illumination.

Finally, the probable efficacy of large doses of ipecacuanha in Asiatic cholera is discussed under cover of the theory advocated.

PART I.

CLINICAL FACTS.

I. Acute Dysentery.

DYSENTERY is a disease in which the peculiar influence of ipecacuanha is not practically recognized by many physicians who, while they have read of its power, hesitate to employ it. And the history of the medicine in this connection curiously illustrates how a valuable remedy may fall into disuse.

Introduced into Europe by Piso and Helvetius in the latter half of the seventeenth century, after fully sustaining the claims made for it the profession at large allowed it to gradually lapse into desuetude, except as an adjuvant to other drugs. Occasional writers insisted on its virtues, as Balmain,¹ in 1797, and Playfair,² in 1813, who clearly describe its successful non-emetic use in large doses; Twining,³ in 1831, who trusted chiefly to it in smaller quantities; and Delioux,⁴ in 1851, who reported its value in large amounts of the infusion, where the vomiting gave way to tolerance on repetition; but it was not until 1858 that the reports of Mr. E. S. Docker, of the British Army, (7th Royal Fusiliers,) attracted general attention to his successful revival of the older methods. But although that is now the common treatment of dysentery in India, where its efficacy is well proven, the practice has spread but slowly elsewhere.

It may be that the singular success reported to follow its careful use, and the insistence that large doses of ipecacuanha may be taken with-

¹ *Mem. Med. Soc. Lond.*,* v., p. 210.

² *Edin. Med. and Surg. Jour.*,* ix., p. 18.

³ *Med.-chir. Rev.*,* xiv., fr. *Calcutta Med. and Phys. Trans.*,* iv.

⁴ *Bul. de Thérap.*,* xli., p. 104.

out emesis or even nausea, have seemed so incredible as to prejudice against it physicians whose constant experience appears to be directly antagonistic. But a good part of the common skepticism results from the persistent manner in which the Indian method is ignored, even by the later systematic teachers, most of whom seem to regard it as inapplicable to other climates. Maclean is the one authority of this class who distinctly and seriously advocates it as essentially non-emetic and as very successful. By him its value is clearly and satisfactorily set forth.¹ Aitken, indeed, in his latest edition² yields to the weight of testimony and gives in his adhesion, but previously he was disposed to discredit it, saying, "the disease though mitigated is seldom cured by these means." Before its revival by Mr. Docker—Polichronie³ says by M. Segond, of Cayenne—authors of text-books naturally would not delve into medical antiquities to treat of obsolete practices and of presumed delusions. But, except as just noted, they still rigorously pass it by, or, what is worse, damn it with faint praise. The references immediately following show the drift of the authorities upon this subject, and are introduced as a condensed statement of the current teaching and as the Apology for this paper.

Niemeyer⁴ treating of catarrhal or sporadic dysentery does not allude to it, and in an elaborate article⁵ upon epidemic dysentery only refers to ipecacuanha as a preliminary emetic when the stomach is overloaded. Heubner⁶ advises from fifteen to thirty grains when the status gastricus exists in the beginning of the attack, to be given until thorough vomiting takes place, and says: "In the tropics it often seems as if a timely emetic cut off the further development of dysentery. In the last war ipecac. was used by some of the English physicians with good result in France." Trousseau⁷ prescribes in the beginning of the attack about twelve grains every ten minutes until vomiting is induced, following it that evening or the next day by salines. He advocates emesis

¹ Art. *Dysentery*, Reynolds' *System*; foot-note *Dysentery*, Aitken's *Science and Practice*.

² 3d Am. fr. 6th Eng., 1872, i., p. 658.

³ *Étude expérimentale sur l'action thérapeutique et physiologique de L'Ipécacuanha et de son Alcaloïde*, Paris, 1874, p. 10.

⁴ Am. fr. 8th Germ. ed., 1871, i., p. 547.

⁵ ii., p. 673.

⁶ Ziemssen's *Cyclopædia*, Am. ed., 1874, ist, p. 564.

⁷ *Clinical Medicine*, Eng. fr. 3d Fr. ed., ii., p. 486.

for its evacuant effect. Watson¹ briefly outlines the non-emetic method of using large doses, prefacing it with the remark that it "counts many experienced advocates." Dr. Hartshorne, the American editor, adds, "more confidence is felt by American practitioners generally in the use of ipecacuanha in small non-emetic doses [implying that larger quantities are nauseating or emetic]: one-half to three-quarters of a grain with a smaller amount of opium every two, three, or four hours, according to the case. Acetate of lead is also much employed," etc. Neither the author nor his editor encourages its use. Dr. George B. Wood, after describing the treatment that he thinks best, writes:² "Ipecacuanha has been thought to exercise a peculiarly favorable influence, and some practitioners have confided the cure chiefly to that remedy." He then briefly adverts to "asserted" cures by large non-emetic doses. In his summary of the approved treatment of dysentery³ he does not mention it. Flint,⁴ who probably represents the most advanced general practice in this country, in sporadic dysentery "places reliance on purgatives and opium." Among the recognized but secondary methods he says: "Ipecacuanha has been considered a valuable remedy in dysentery. Some have attributed to it a specific curative influence, and have advocated its employment in as large doses as can be borne," and then quotes Maclean. In his earlier editions he does not comment upon it, but in the latest he adds: "I have resorted to this plan of treatment in a considerable number of cases in Bellevue Hospital, but without a very satisfactory degree of success. * * in the majority of cases it had no apparent influence on the disease." In epidemic dysentery he does not refer to it. The same author in a lately published paper⁵ speaks of sporadic dysentery in a temperate climate as a self-limited disease whose "duration is but little, if at all, abridged by methods of treatment now and heretofore in vogue." Neither Meigs and Pepper⁶ nor West⁷ refer to ipecacuanha in the dysentery of children except in minute diaphoretic doses. The French, since its revival in intestinal affections, use it chiefly as an emetic, in the form of the Brazilian draught (*potion brésilienne*): viz., 10

¹ Am. fr. 5th Eng. ed., 1872, ii., p. 581.

² *Practice*, 5th ed., ii., p. 633.

³ p. 637.

⁴ *Practice*, 4th ed., 1873, p. 372.

⁵ *Am. Jour. Med. Sci.*, cxxxix., July, 1875, p. 39.

⁶ 4th ed., 1870.

⁷ 4th Am. fr. 5th Eng. ed., 1866.

grammes of the bruised root boiled in 200 grammes of water until it is reduced to 100 grammes, and then sweetened.

Besides, a study of the leading therapeutists, as will be seen later, shows that those who have not had personal experience with it look upon the drug as necessarily emetic, and the treatment as essentially of that character. Waring¹ is the only one of this class that I have seen who is careful to insist that in dysentery twenty or more grains may be taken into the stomach without emesis. He credits his paper chiefly to Professor Maclean, and they, who both appear to have had personal experience in its use, are the only authors of rank that I have consulted who bring this feature into prominence. Ringer² makes the same statements, resting chiefly on Mr. Docker's reports, but without giving them the prominence that their importance deserves, although he states that large doses will often succeed where small ones fail. Upon the whole, it is probable that comparatively few practitioners pursue or even have faith in the non-emetic method.

In contrast, therefore, with the prevailing practice, the following cases are offered as so many clinical facts which may be useful by inviting renewed attention to a subject, that, in some parts of our country, is of vital interest. And some of these, as well as of those illustrating other uses of ipecacuanha, are set forth in greater detail than would be proper were they only covering admitted therapeutic ground.

CASE I.—C. D. had suffered with a severe diarrhœa several days and reported sick 19th May, 1874, at Atlanta. He had fever, severe pain in the bowels, small bloody discharges with straining—in short, dysentery. He was taken in hospital and given tr. opii ℥.xv., and, in half an hour, pulv. ipecac. gr. xx., in a very little water. A sinapism was applied to the stomach. This treatment was repeated in four hours. There was no emesis; the bloody discharges at once ceased; the pain and tenesmus gradually passed away; a soft, but not dysenteric, stool occurred in the middle of the day, and in the evening he expressed himself as very comfortable. He was kept in bed without medicine two days, was sent to quarters 22d, and to duty 24th May.

CASE II.—J. H. F., a soldier of twenty years' service, seasoned, and in good general health, although an occasional hard drinker, was admitted hospital with a typical case of acute dysentery, Atlanta, 29th May, 1874. The attack was recent but very severe, and he was suffering extremely. He was immediately given tr. opii ℥.xx., followed in twenty minutes by pulv. ipecac. gr. xxv., in a small quantity of water, and by a sinapism. The bloody stools ceased forthwith, and he began to perspire and to feel

¹ *Practical Therapeutics*, 2d Am. fr. 3d Lond. ed., 1871, p. 356.

² *Handbook of Therapeutics*, 4th ed., New York, 1875, pp. 397-8.

relieved. The dose was repeated in six hours, and ten grains more was given at 9 P.M. There was no vomiting. One or two copious dejections, without pain and bloodless, occurred during the day; and by noon he declared himself much better and free from pain. The next day, with no other treatment, he was well but very weak. The prostration remained several days, but there was no return of the disease.

CASE III.—C. C. was admitted hospital, Atlanta, with a well-marked case of ordinary acute dysentery, 1st July, 1874. The ipecacuanha treatment was at once adopted and the discharges promptly ceased. He remained in bed that day and got up on the 2d. On the 2d he had two passages before 4 P.M., each marked with a trace of blood. He was again sent to bed and was given, in the same manner, one scruple of the powder, which was easily retained. The next day he was returned to duty.

CASE IV.—F. H. W. had four dysenteric discharges—small, painful, bloody, with straining—during the night of 6th July, 1874, at Atlanta. He attributes his condition to unusual food on 4th. Admitted hospital 7th. 9 A.M.—Feels badly, but has had no passage since five o'clock. Temperature normal. As a precaution, and also as an experiment, was put in bed and given twenty-five grains of ipecacuanha without opium. 4 P.M.—Very comfortable; skin warm and perspiring; the abdominal pain that existed at admission gradually passed away; was a little nauseated about one o'clock, but did not vomit. 9 P.M.—Gave ten grains of ipecacuanha without an adjuvant.

8th.—Retained the medicine easily last night; feels well to-day.

9th.—Duty. Although this man had no dysenteric stool while in hospital, I have no reason to doubt his word, for his character is excellent. He reported on the sick list promptly, because he had had a severe attack of dysentery in 1863 that began exactly like this.

CASE V.—B. R. This man had been returned to duty, from sick with diarrhœa, 9th July, 1874, at Atlanta (see Case XXX.). Upon careful inquiry it appeared that he had had some trouble with his bowels ever since, but not enough to prevent him from attending to duty. He came again, however, upon sick report 27th July, saying that he had noticed blood in his stools at 4 A.M. the day before. He had abdominal pain with numerous small, painful discharges, with straining, (tormina and tenesmus,) throughout the day. Thinks that he had at least twenty stools in the day and ten in the night. Slept hardly at all last night, by reason of the disease. Went to the sink three times before sick call, 5:45 A.M. Given a bed at 6:30 A.M., and between that hour and eight o'clock had two stools. All of these, say thirty-five in twenty-eight hours, were small and accompanied by pain and straining. He described them as bloody also. Those passed in hospital were small, of a jelly-like or glairy fluid, uniformly reddish throughout, but not streaked with blood. There was constant pain in the abdomen, the tongue was covered with a thin, white fur, the skin was harsh and dry, the pulse moderately rapid and wiry, and the general appearance one of fever, although the thermometer under the tongue only indicated 97.6° F. As I afterward learned, this man looked upon himself as critically ill, and his First Sergeant reported to his Captain that it was not believed that he would live till night. This is mentioned to show how he appeared to the men who were familiar with him and who observed a sudden and alarming change. 8:30 A.M.—Given tr. opii $\mathfrak{m}$.xv., followed in twenty minutes by pulv. ipecac. gr. xxx. and a sinapism. 2 P.M.—Rested perfectly quietly and easily all the morning, entirely free from pain and from nausea. The bowels moved copi-

ously but without pain at 1:30 P.M. This discharge was perfectly liquid and free from the glairy character of the previous ones; its color was yellow and floating on top were particles resembling curdled milk. His skin was moist and gently perspiring, and his pulse soft. 3:15 P.M.—Bowels again moved. 3:20.—Ipecac. gr. xx., without tr. opii, and with a sinapism. 4:20.—Vomited about two ounces. 5:45.—Bowels moved, and ten minutes later four ounces fluid thrown from the stomach. 6:30.—Vomited four ounces, and a stool followed. None of these motions were dysenteric, but they all resembled the one previously described. 8—Temperature, 99°; tongue moist and cleaning off; has neither eaten nor drank in the hospital, and is now thirsty but not hungry. 9 P.M.—Tr. opii ℥.xx., followed by ipecac. gr. xx.

28th.—Vomited, quantity and character undetermined, at eleven and two o'clock in the night; two painless passages in the night. Tolerably copious, fluid, yellowish stool, with some of the curdled milk appearance at 8:39 A.M. Temperature, 98.6°. Has no pain at all and is comfortable; pulse natural; skin moist and pleasant. 1:30 P.M.—Bowels moved much as before. Bowels again moved at 4:30, 5:30, and 6:30 P.M., discharges thin, but more natural in color; there was a little straining but no pain. 9 P.M.—Tr. opii ℥.xv., followed by pulv. ipecac. gr. xxv.

29th.—Painless, liquid, but otherwise natural stools at 11 P.M. and 4 A.M. No emesis; tongue normal; feels well. To take Squibb's diarrhœa mixture at 8:30 and Hope's at 11 A.M. Evening.—Four small, brownish, fluid passages approaching the natural color, with very slight pain, during the day. 8 P.M.—Hope's mixture f.ʒi. 9 P.M.—Ipecac. gr. xxv.

30th July.—Three thin, dark discharges before daylight; vomited at 3 A.M. Bowels moved at 8 A.M. Tongue clean and natural. R. Acid. sulph. arom., tr. opii c., āā. ℥.xv., aquæ f.ʒij., every two hours. P.M.—Bowels moved twice painlessly.

In this case the bowels gradually acquired their natural tone, chiefly under the use of mineral tonics; the man's general feeling was healthy and comfortable at all times. He was returned to quarters 4th, and to duty 11th August. It will be observed that the continued use of large doses of ipecacuanha, after the dysenteric symptoms ceased, was somewhat in the way of experiment, and that the very violent dysentery with which the man was stricken down yielded at once and without emesis to that drug.

In the following case actual dysentery did not occur, but the condition so closely resembled it that it appears no violation of propriety to introduce it under this heading. It is of interest when the age of the patient and the size of the dose are borne in mind. The case was in the charge of Acting Assistant Surgeon S. S. Beach, who kindly supplied me with his notes of it.

CASE VI.—R. T., not quite three years old, the daughter of an officer, is reported 4th August, 1874, to have had very loose bowels for the past ten days, the motions said to be watery and filled with undigested food. Found her in the evening with great thirst; a strong craving for fruit and vegetables, which had been largely indulged; fever, reported to have

occurred for the past three days; pulse 110; lips scarlet; tongue, red at the edges and tip, covered with a closely-lying, light-brown coat from the centre back; has six to nine stools every twenty-four hours—generally two in the night—preceded by some pain and followed by a disposition to strain, character like the first, but with more mucus, no blood. Dr. Beach observes: "Ordinarily I should have given a dose of calomel and Dover's powder, followed by castor oil, laudanum and turpentine; but, learning of the successful use of ipecacuanha in similar cases," he ordered pulv. ipecac. gr. vij., in a paste with water, preceded fifteen minutes by tr. opii comp. ℥.x., on going to bed. All drinks, except small quantities of cold tea, withheld.

5th August.—The child complained of thirst for half an hour last night, and then slept till 2 A.M., perspiring freely. Had two stools, half an hour apart, similar to the former ones, except that there was less watery mucus and pain. At seven o'clock had a painless discharge resembling the ipecacuanha paste. 10 A.M.—Pulse 90; skin cool and moist; lips less red; edges of tongue paler; coat white and raised; less thirst; bright and playful. Allowed only cold tea, dry toast, and boiled rice, no medicine. 7 P.M.—Had no fever to-day; lips paler; tongue cleaner and paler; drank nothing but tea; continues bright and playful; had two slight evacuations from the bowels, both natural and without pain or straining, since 7 A.M.

This child regained its usual health by simple attention to its diet.

The following case is interesting, from the size of the dose, the age of the patient, and his previous history.

CASE VII.—D. K., aged seven years, an officer's son, when in health a robust and vigorous boy, was, after a week's sharp attack of remittent fever, left with a diarrhoea that assumed a dysenteric character. There were from six to eight stools daily, and after each there was a small mucous discharge, generally mingled with blood and always passed with straining. There were also occasional tenesmic feelings and ineffectual efforts at stool. On two previous occasions he had been seriously ill with a complaint beginning exactly in this manner, which obstinately lasted for months, resisting changes of climate and great variety of treatment.

2d Sept., 1874.—He has been sick as just described, without treatment, for four days. The first morning passage is natural, but each successive one through the day becomes worse. To-day he has had six stools, all with straining, with consecutive mucous passages, and with some blood. He has also made two ineffectual efforts. Otherwise, except as he is weak from the fever, his health is fair. 9 P.M.—Took tr. opii c. ℥.xx., aquæ f.ʒj., followed in fifteen minutes by pulv. ipecac. gr. x., aq. f.ʒj., with a few drops of paregoric to disguise the taste. He fell asleep almost immediately and slept undisturbed all night.

3d.—His bowels were moved earlier than usual this morning, and he had, in all, four stools during the day. None of these were painful, there was no straining and no blood was passed and there were no ineffectual efforts. One passage was accompanied with some mucous slime. 9 P.M.—The medicine was repeated exactly as last night.

4th.—He slept quietly for an hour and a half immediately after taking the medicine, and then awoke vomiting profusely. The act of emesis awoke him and the discharge was copious, including his tea and perhaps

the remains of his dinner. There was no pain, the vomiting was accomplished in one act, there was no subsequent nausea, and he slept well the rest of the night. The bowels remained a little loose, but not painfully nor unnaturally so, for a day or two, and attention to diet was the only further care.

His parents expressed themselves greatly surprised at the prompt and favorable termination of this attack, for their previous experience had led them to dread a long-continued and serious illness.

CASE VIII.—A. C., admitted hospital 6:30 A.M., 9th April, 1875, at Atlanta, having reported that he had about twenty small passages with pain and straining during the preceding afternoon and night, and that he now has constant abdominal pain. 9 A.M.—Two small, mucoid, slimy stools, with constant tormina, since admission. Given pulv. ipecac. gr. xv, tr. opii ℥.xv., in a very little water. He fell asleep and rested quietly after taking the medicine until two o'clock, when he got up and ate a hearty meal. Had two small, painful operations in the afternoon, and at six o'clock took ipecac. gr. x., tr. opii ℥.x. A mustard plaster was applied on account of a feeling of nausea, and he did not vomit. Temperature: A.M., 98.6°; P.M., 99.4°.

10th.—A copious, painless motion occurred for the first time at 3 P.M. Temperature normal, no medicine.

11th.—Feels perfectly well and returned to duty.

CASE IX.—First Sergeant G. S. B. reported at sick call 16th April, 1875, at Atlanta, as having had many small and painful fecal discharges tinged with blood, and frequent abdominal pains, the preceding afternoon and night. Being married he was allowed to remain at his quarters, and was given opii gr. j., pulv. ipecac. gr. xx., in pil. iv., to be taken after lying down. He had a passage like those described at 7 A.M., and then took the medicine. By a misunderstanding, he took four more pills like the above at nine o'clock. About ten o'clock, under a misapprehension of orders, he attended a court-martial as a witness, but, notwithstanding the second dose and the exercise, he was only slightly nauseated. He fasted all day until evening and took no other medicine. His bowels did not move after taking the first dose until the next afternoon, when he had a tolerably copious, liquid operation without pain.

18th.—Duty.

In this case I depended in all respects upon the man's statements, but he is a highly reliable non-commissioned officer, whose word there is no reason to doubt.

CASE X.—Mrs. —, about four and a half months pregnant, having suffered with a severe facial neuralgia that was relieved with great difficulty, was attacked with marked dysenteric symptoms in the night of 29th May, 1875, at Atlanta. Early the next morning she was given fifteen grains of ipecacuanha, with three-fourths of a grain of opium. This was retained, and the painful discharges at once ceased.

CASE XI.—Mr. V. This is the case of an elderly gentleman of delicate health and sedentary habits. He had suffered for several days with a diarrhoea which, on the night of 4th June, 1875, assumed a dysenteric character. About 10 A.M. of the fifth, he was given fifteen grains of

ipecacuanha and three-fourths of a grain of opium. He neglected to use the sinapism provided, and at noon vomited about a mouthful of fluid. The dysenteric tendency at once ceased and the diarrhœa soon faded out.

CASE XII.—J. V., admitted hospital at Atlanta, 9th June, 1875, complaining of a severe dysenteric diarrhœa with pain and debility. He had two small slimy passages soon after admission. 7 A.M.—Temperature, 98.4°; R. Ipecac. gr. x., tr. opii $\mathfrak{m}$.x. 6 P.M.—Temp., 99°. Had two slimy, bloody passages, with pain, in the afternoon. 9 P.M.—R. Ipecac. gr. xx., tr. opii $\mathfrak{m}$.xx.

10th.—Slept well all night, but still has some pain. Temp., 98°. R. Ipecac. gr. v., opii gr. $\frac{1}{4}$. Some nausea but no vomiting succeeded. Had two typical dysenteric stools, with less pain, in the morning. Given ipecac. gr. xx., tr. opii $\mathfrak{m}$.xv., at bedtime.

11th.—Slept well all night; sent to quarters this morning.

12th.—A little watery diarrhœa and superficial tenderness remaining, a dose of Hope's mixture was ordered after every second passage.

13th.—Had but one stool yesterday, and one just tinged with blood this morning. Feels better, but weak. Hope's mixture continued.

14th.—Well but weak. Duty.

These have been selected from those occurring in my own practice within the past two years, not as specially successful cases, but as fair types of the whole; and they have been written out, in this possibly unnecessary detail, in order that the reader may draw his own conclusions. It may be objected that these were all mild sporadic cases: but, although they promptly recovered, some of them were very severe in their symptoms. For example, Case II., where the suffering on admission was extreme; V., where I afterward learned that neither the man himself, nor his comrades who saw his prostration, supposed that he would rally; VII., where it was reasonable to anticipate as obstinate an attack as had been twice previously suffered. I am fortunate, however, in being able to add from the practice of civil friends, certain corroborative cases, which cannot be classed as mild, where this remedy was used at my indirect instance.

CASE XIII., in the practice of Dr. J. S. Knox, of Chicago.—A lady, two months pregnant, had severe dysenteric tenesmus and tormina, with small and frequent stools, but without the characteristic discharges. She had used suppositories of opium and belladonna for three days ineffectually, and abortion was feared. She took sixteen grains of ipecacuanha in two hours, when all pain disappeared; she had an easy evacuation several hours afterward, and she was well the next day, without further medication. There was nausea but no vomiting.

CASE XIV., in the practice of Dr. V. H. Taliaferro, of Atlanta.—An old lady, frail and delicate, sixty-five years of age, after some days of slight dysenteric symptoms, was violently attacked with the disease in its most aggravated form. The severe dysenteric symptoms were attended with high fever, delirium, and great restlessness. She was ordered twenty-grain doses of ipecac. every four or six hours, each dose preceded twenty minutes by fifteen drops of laudanum. After the first dose the fever and

delirium commenced to subside, and after the second dose she perspired freely, fell asleep, and woke up after a good night's rest refreshed and feeling quite relieved. During the early part of the morning she had a copious faecal dejection. She was discharged without further medical treatment, and had no return of the disease. There was no nausea.

CASE XV., in the practice of Dr. Taliaferro.—A large and vigorous policeman was suddenly and violently attacked with dysentery. He had great pain and tenesmus, with small and frequent stools, chiefly of mucus and blood. He had also high fever, and partial delirium. He was ordered thirty grains of ipecacuanha, preceded by twenty drops of laudanum, every six hours till relieved. The man took but one dose and was entirely relieved, not requiring a second one. Twelve hours after taking the medicine he had a copious evacuation of the bowels. There was no nausea. He had no relapse.

CASE XVI., seen by Dr. Taliaferro in consultation.—A rather delicate man, aged about thirty, had been ill with dysentery, and under treatment with mercury, salines and opium two weeks. At the time of the consultation his symptoms had in no wise abated, but were constantly growing worse. He labored under great nervous excitement and most painful restlessness. He was greatly reduced, and had some hours previously taken a saline cathartic with an opiate. Feeling a little timorous about the heroic use of ipecacuanha under these circumstances, and as his bowels had just been purged, Dr. Taliaferro advised that for the night he be given opium freely, with the hope of rest and sleep. One grain of opium every four hours during the afternoon and night had no effect in relieving the dysentery or inducing sleep. The next morning the patient said that he felt that he must die without sleep; that he was scarcely cognizant of sleeping for eight or ten days. Dr. Taliaferro advised twenty grains of ipecacuanha every four hours, preceded by twenty drops of laudanum each time. He had been for days vomiting and retching almost constantly, and difficulty in retaining the medicine was feared. Dr. T. prepared the medicine himself and gave it in just enough water to enable it to be swallowed. It was immediately followed by a little lump of ice in his mouth and his face was sprinkled with ice water. The medicine was retained with effort, and visible improvement followed the first dose. The patient slept and rested gently for the first time since his sickness. The morning after commencing the medicine he was decidedly improved in every respect. Without following the case from day to day to recovery, it may be said that a painless diarrhoea, which finally yielded to morphia administered subcutaneously, was the only subsequent condition that was troublesome. The dysenteric symptoms, fever, and restlessness were promptly relieved.

These cases occurred early in the autumn of 1875, and in communicating them Dr. Taliaferro remarked that he was more and more satisfied of the great value of ipecacuanha when administered non-emetically. Out of a number of cases of dysentery treated in that way he selected those as the worst. In each case the conditions laid down in this paper were carefully enjoined and strictly followed in its employment.

CASE XVII., in the practice of Dr. J. C. Le Hardy, of Savannah.—J. C., æt. 19, white. Has suffered for three weeks with tertian intermittent

and for the last eight days with acute bronchitis of both lungs following exposure. Has been treated with purgatives, quinine and cough mixtures. Awakened in the night of 20th December, 1875, with pains in the bowels, and had half hourly dysenteric discharges with increasing pain, for which mustard and poultices containing laudanum were applied.

21st Dec.—Dr. Le Hardy saw him for the first time at 11 A.M. Respiration 32, pulse 124, temperature 102.5°; very restless, and screaming with the violence of the pain, which he described as extending from the rectum to the navel. Ordered pulv. ipecac., quin. sulph., aa gr. xl., in eight capsules; one every two hours till four are taken. The first dose was taken at 11:45 A.M. At 1 P.M. the patient stated that the pain had almost subsided, and that he felt a great deal better. At 5 P.M. had one action containing blood and mucus; suffered but little pain in the interval.

22d.—9 A.M. Free from pain or fever. Had one watery action still containing blood, without pain. 5 P.M.—Without fever or pain; had had a semi-solid action without blood.

23d.—11 A.M. No fever; bowels not moved; patient convalescent and discharged. There was no relapse.

In this case, which also illustrates the co-dependence of dysentery and intermittent, it will be observed that the physician prescribed quinine in equal quantities with the ipecacuanha. To a certain extent, therefore, the treatment was complicated. Neither opium nor mustard was used.

CASE XVIII., in the practice of Dr. W. H. Elliott, of Savannah.—A white woman, aged 32, was seen December, 1875, when sick three weeks with a remittent fever accompanied by acute dysentery. The fever was high and was a true remittent. The dysentery was severe and was marked by eight or ten actions in the twenty-four hours. At the first visit twenty grains of ipecacuanha was prescribed at one dose and the dysentery immediately ceased and was succeeded by natural operations. The fever yielded in the usual time to ordinary measures, and there was no relapse of the bowel affection.

CASE XIX., in the practice of Dr. Robt. P. Myers, of Savannah, as Superintendent of the Georgia Infirmary.—C. B., æt. 25, negro; tall, thin, and emaciated from want of proper food and shelter. Admitted 20th December, 1875. Says he "has had bloody stools with matter in them for two weeks." At this time is suffering with acute dysentery, and intense pain in the lower portion of the back and rectum and anus. Has been going to stool so often that he could not remember the number, day or night. Given vini ipec. ℥.ij., in a teaspoonful of water every two hours. After the second dose felt much better and had but two stools before night.

21st.—Greatly improved; three stools during the day, and four at night.

22d.—Improving; only two stools during the day, and one at night.

23d.—Greatly improving; had two moulded passages.

24th.—One natural passage.

27th.—Discharged well.

For the first two days he was kept steadily in bed, and was given spts. am. arom. f.3ss., three times a day. He was confined to an

arrow-root diet while in the hospital. That case is interesting from being a severe one checked with smaller doses than commonly used. The rest and careful diet of course were important factors in this case, as, indeed, they should be in all treatment of dysentery.

The following cases of acute diarrhœa, which bear a natural relation to this subject, were also treated at the Infirmary by Dr. Myers, who has kindly supplied these notes.

CASE XX.—J. W., æt. 40, negro, short and stout. Admitted 4th January, 1876, with intermittent fever, for which he was treated with quinine and iron. Improved until 18th, when night-sweats occurred, for which he was given aromatic sulphuric acid.

1st Feb.—Stopped medicine, and appointed him nurse.

11th Feb.—Violent acute diarrhœa, supposed due to imprudent diet. Given pulv. ipecac. ℞j., which did not vomit; low diet of arrow-root or soft-boiled rice; and to take fifteen drops of the wine every two hours.

16th.—Returned to duty, well. A few days later the diarrhœa returned from the same cause, and yielded promptly to the same treatment.

CASE XXI.—C. D., mulatto. Severe diarrhœa, compelling him to go to bed, in character like that of last case. Treated exactly as Case XX., with complete recovery in three days.

CASE XXII.—A. F., negro; tall and thin; subject to much exposure as fisherman. Entered 3d March, 1876, with violent diarrhœa. Given twenty grains of ipecacuanha without nausea, followed by twenty drops of the wine every two hours. Well on the third day.

These last cases are chiefly interesting as illustrating the toleration by the stomach, under certain conditions, of large amounts of ipecacuanha.

These, taken together, establish with reasonable clearness the readiness with which ordinary sporadic dysentery yields to large doses of ipecacuanha, and that ipecacuanha in twenty- and thirty-grain doses does not necessarily cause emesis.

In Mr. Docker's original paper he states¹ that he generally begins with an emetic, always with a thorough clearance of the bowels. I have not employed either of these preliminaries—his severer forms of the disease, perhaps, requiring it. I have, however, in the main, followed his other directions, although making many experimental modifications. My present opinion is, that ten or fifteen minims of laudanum should be first given on an empty stomach, to be followed in ten or fifteen minutes by from fifteen to thirty or more grains of ipecacuanha, according to the gravity of the case, in pill form or

¹ *Lancet*, Am. ed., Oct., 1858, p. 254.

with a very small quantity of water. A few minutes later a mild counter-irritant, such as a sinapism or tincture of iodine, may be applied to the epigastrium. The patient should rigorously abstain from fluids and food for at least four or, better, six hours, and should strictly preserve recumbent rest during the same period. Case IX. shows that rest is not invariably essential, but I believe that it is sufficiently important to lay it down as a precept that cannot safely be violated. Although I usually administer the mild preliminary opiate, I am not at all sure that it is necessary, and it certainly is not nearly as important as that the fluid vehicle should be very small. If pills are used, they should be freshly made, and the laudanum may be incorporated with them. One scruple of ipecacuanha and one grain of opium, with care, can be made into four pills. Or, twenty grains of the powder can be suspended in about two fluid-drachms of water, and a few drops of spirits of lavender, or a similar aromatic, added to disguise the taste. Capsules of gelatine have been suggested as a convenient vehicle. It is generally well to conceal the name of the drug, and always to urge the patient to resist any inclination to vomit. But even when it does occur, vomiting from ipecacuanha is mild, and there are few patients who would not willingly endure it, if necessary, to escape the suffering and danger of an attack of dysentery.

The following table shows the facts concerning emesis in twenty-six of my own cases of dysentery or strongly marked dysenteric diarrhœa. The tabulated doses were from ten to thirty grains, the most of them being of twenty grains.

How administered.	Retained.	Vomited after one hour.	Total.
With opium and mustard.....	12	2	14
With opium only.....	31	7	38
With mustard only.....		1	1
With no adjuvant.....	1		1
Aggregate.....	44	10	54

Thus, vomiting occurred after only ten of the fifty-four doses, and it was in nearly every instance directly traceable to some violation of orders, and was generally trivial. In every instance the dysenteric disease yielded to the ipecacuanha treatment alone, and in nearly

every case the character of the stools radically changed for the better after the first dose. The most irregular of all of these cases was V., but even it very clearly shows the value of the method.

I think that the results attained, confirmatory as they are of the earlier traditions and of the recent Asiatic experience, warrant, on purely empirical grounds, a greatly extended trial of this treatment in dysentery, and point to the restoration to the drug of its old title, "*radix anti-dysenterica*."

II. Additional Modern Evidence in Acute Dysentery.

As observed, the successful treatment of dysentery in this manner is common in India, and it may be that it is pursued by many physicians in this country. That the practice recited is not unique the following memoranda indicate. These do not pretend to be complete, but they may assist students caring to investigate the subject.

Some earlier¹ papers and some Indian² ones are referred to below—Dr. John Davy³ quotes Dr. Massey, who recommends substantially the method carried out in the cases just reported. Dr. Ruschenberger, U. S. Navy, who has had considerable experience in inter-tropical dysentery, informs me that he has found Mr. Twining's plan efficacious, and generally speaking, satisfactory. Six grains of ipecac. with four grains of extract of gentian in two pills, night and morning, with a small dose of compound jalap powder at midday, was an efficient routine course in moderately severe cases of acute dysentery on board of ship. Dr. Richard Whittingham,⁴ Surgeon Peruvian Navy, in simple, specific tropical dysentery, either common or bilious, gives from half a drachm to a drachm of the powder fasting, or early in the morning, and says: "The medicine is *not* given as *emetic*, but to produce its specific action on the disease." He also gives an enema of ipecacuanha night and morning. The above is repeated for

¹ *Mem. Med. Soc. Lond.*, 1792, iii., p. 517: *ibid.*,* 1797, v., p. 210: *Edin. Med. & Surg. Jour.*,* 1813, ix., p. 18.

² Docker, *Lancet*,* July, Aug., 1858, pp. 113, 169; *Am. reprint*, Oct., 1858, p. 254: Cornish, *Madras Med. Jour.*,* Jan., 1861, p. 41; *Ranking's Abstract*,* xxxiii., p. 91: Blacklock, *Madras Med. Jour.*,* Jan., 1861: Donaldson, *Edin. Jour.*,* v., p. 583: Ewart, *Indian Ann. Med. Sci.*,* 1863, p. 396; *Brit. For. Med.-chir. Rev.*,* xxxii., p. 58: Cunningham, *Edin. Jour.*,* vii., p. 25.

³ *Diseases of the Army with Contributions to Pathology*,* London, 1862.

⁴ *Am. Jour. Med. Sci.*, 1860, xl., p. 379.

three days. Or he gives ten grains with one grain of opium every six or eight hours, and uses vegetable astringents, such as pomegranate root. In other varieties the treatment is modified accordingly. In the malignant form he relies on nux vomica and opium. The mortality in hospital is less than two per cent. of the cases seen before the colon is ulcerated. Dr. Stillé described the Brazilian treatment of bilious dysentery and summarized Dr. Whittingham's article in a paper published by the Sanitary Commission [1862-3?] and afterward printed with their collected essays. This I have not seen. Dr. E. H. Janes¹ gives an abstract of the treatment of acute dysentery by large doses of this drug with statistics of the result. An article by Dr. H. D. Bulkley,² contains this sentence: "It is said that the native doctors of Constantinople invariably give large doses of ipecacuanha in dysentery, and that it is very successful." I am informed that Dr. Bancroft, now of Denver, Colorado, and Dr. De Wolf, now of Northampton, Massachusetts, when on duty with Pennsylvania and Massachusetts volunteers, respectively, successfully treated in this way dysentery occurring in their commands on the South Carolina coast in 1863; and that Assistant Surgeon Patzki thus used it at Lincoln Barracks, Washington, 1868, having previously so employed it in 1863-4, and, later, Surgeon Edwards, in Texas. Dr. J. C. Hall³ states that in a large number of cases of acute dysentery it proved eminently valuable at Vicksburg, Miss. Dr. A. H. Hoehling,⁴ U. S. Navy, reports ipecacuanha as the chief reliance in the treatment of this affection in Chili, and cites, as a type, the case of a man ill five weeks who was restored to health in seven days mainly by the use of this drug. Dr. John Stephen,⁵ of Reading, Penna., reports three cases of severe acute dysentery cured immediately by ipecacuanha in doses of from thirty to eighty grains. These are well worth study, and are presented by that gentleman as examples "out of quite a number" that all yielded in the same way to the same means. He regards it "as much of a specific in acute dysentery as is quinine in intermittent fever." Dr. A. P. Morrill⁶ recalls the usual practice in dysentery with ipecacuanha fifty years ago in the Southern States.

¹ *Am. Med. Times*,* 1861, iii., pp. 28, 274.

* ³ *Med. and Surg. Rep.*,* Feb. 15th, 1868.

⁵ *Ibid.*, 1870, xxiii., p. 419.

² *Ibid.*, 1862, iv., p. 64.

⁴ *Ibid.*, 1868, xix., p. 327.

⁶ *Ibid.*, p. 503.

Dr. Dyce Duckworth¹ quotes corroborative modern experience from Mr. Hunter, Belize, Dr. Yandell, [Louisville?] Dr. Clark, London, and Mr. Eccles, Bombay, the last named frequently using emetia as a substitute for the vegetable. Dr. W. C. Maclean² reports the case of an officer who was passing upward of twenty bloody stools in twelve hours, and was in a state of such extreme exhaustion that his death appeared imminent. After one dose the stools were reduced to six in twenty-four hours; on the second day the blood disappeared altogether; and he made a perfect recovery. Dr. T. M. Woodson,³ of Gallatin, Tenn., reports nine cures of that disease by this method in the summer of 1873. A letter in the *Medical Times and Gazette*⁴ sets it forth as the current treatment in the Madras General Hospital. Lady Duff Gordon, in her charming *Last Letters from Egypt*,⁵ incidentally refers to its usefulness, in her hands, in the dysenteries of the Nile, 1866-8. Dr. M. Lewis,⁶ of Lenoir, Tenn., reports six cases, in five of which extremely prompt relief followed doses varying from twenty to fifty grains. In the *Sanitary and Medical Reports*⁷ of the Navy Department for 1873-4, Surgeon J. C. Spear, U. S. N., writing of dysentery at Valparaiso, says: "In its treatment, the physicians resident here are unanimous in their praises of large doses of ipecacuanha. The common people, often unable to get medical advice, employ themselves ipecacuanha in large doses when they have dysentery, and among them it has come to be generally known as the favorite remedy in this affection." The *Virginia Medical Monthly*⁸ reports successful cases from Alabama, and in the *New Orleans Medical and Surgical Journal*⁹ are several typical illustrations from Texas, and a letter showing the spread of this practice in Kentucky and Tennessee. The latest special papers on this general subject that I have seen are a series of reports by M. Chouppe, published in various French journals, in the summer of 1874, and an essay by Dr. C. A. Polichronie.¹⁰

The only feature common to the papers cited in this section is the

¹ *St. Barth. Hosp. Rep.*, 1871, vii., pp. 111-113.

² *Lancet*, Am. reprint, July, 1871, p. 382.

³ *Amer. Practitioner*, ix., Jan., 1874, p. 31.

⁴ 1874, i., p. 407.

⁵ 1875, p. 156.

⁶ *Am. Med. Weekly*, Oct., 1875, iii., 18, p. 205.

⁷ Washington, 1875, p. 103.

⁸ Oct., 1875, ii., p. 517. *

⁹ Nov., 1875, pp. 356, 443.

¹⁰ *Op. cit.*

praise of ipecacuanha in dysentery. The methods of administration range from the true non-emetic use of very large doses, to the extreme of using infusions and decoctions expressly to produce vomiting. References to other papers on this subject will be found in subsequent sections.

III. Chronic Dysentery and Chronic Diarrhœa.

Akenside,¹ as quoted by Duckworth,² says of the use of the drug: "*Neque interest utrum acuta sit dysenteria, an chronica: utrum sanguinem habeant dejectiones, an muco tantum constant;*" Pringle³ commends it either alone or in combination; and modern evidence is gradually accumulating in favor of the treatment of chronic dysentery, and of some forms of chronic diarrhœa with ipecacuanha, generally in large doses.

Dr. Bulkley (*loc. cit.*) reports four cases of chronic dysentery and diarrhœa in which ten-grain doses were administered. One of these patients vomited, but all were immediately relieved. He refers to Dr. McKidd's⁴ case of the prompt cure of a diarrhœa of ten years' standing by ten to twenty grains of ipecacuanha given every twelve hours. Dr. Willshire⁵ reports a grave case of chronic dysentery with severe exacerbations which, after thirty days' unsuccessful treatment, improved upon a prescription in which four grains of ipecacuanha three times a day held the chief place. Lt. Col. Charles Sutherland, Assistant Medical Purveyor, has kindly furnished me with the following outline of a remarkable case occurring in his practice when an Assistant Surgeon.

CASE XXIII.—Mr. L. P., a civilian at Fort Davis, Texas, afterward a consular officer in Mexico, had suffered for more than two years with an obstinate chronic diarrhœa, for which he had taken innumerable remedies at the hands of several physicians but with no permanent benefit. On joining that post, in 1858, Dr. Sutherland found him having three or four evacuations daily as a habit, and frequently, after an error in diet, twice that number. He had despaired of relief and contented himself with taking opium pills as his symptoms indicated. Following the precautions prescribed by the physicians of the East Indian Army, he was given forty grains of ipecacuanha, in ten-grain doses, in the course of six

¹ *De Dysenteriâ Commentarius*,* 1764, p. 39.

² *St. Bart. Hosp. Rep.*, 1871, vii., p. 116.

³ *Observations on the Diseases of the Army*, 7th ed., 1775, p. 283.

⁴ *Edin. Med. Jour.*,* July, 1861.

⁵ *Lancet*, 1862, ii., July, p. 62.

or eight hours, without any disturbance of the stomach. After this trial he had no operation for nearly a week, and when it did occur there was a perfectly hard stool, the first one, he said, that he had had for two years. Up to the time he was last seen, in 1868, he had no return of his previous symptoms.

Dr. Sutherland habitually used large doses of ipecacuanha in the treatment of acute and chronic diarrhœa and dysentery, particularly in chronic diarrhœa, after attention was attracted to it by the *Lancet* in 1858, but, unfortunately, his notes were lost in Texas at the outbreak of the war.

I am indebted to Assistant Surgeon Charles R. Greenleaf, U. S. Army, for the notes from which the following case is taken.

CASE XXIV.—Corporal A. P., æt. 24, taken on sick report with chronic dysentery at Fort Lapwai, Idaho, 23d July, 1872. He was emaciated, pale and feeble, without appetite, and had slight fever, a constant desire to defecate, when he passed small, very offensive, discharges of mucus, blood and, occasionally, fæces, and suffered much tenesmic pain. His history was that of nine months' dysentery, with occasional intervals of ease, in Arizona, where he had seen considerable service and whence his command had recently been transferred. [Partial notes of his treatment at Camp Bowie, A. T., show the use of sulphate of iron with small quantities of opium and ipecacuanha.] The man stated that he had taken much medicine without permanent benefit, and he was very despondent as to his ultimate cure. Dr. Greenleaf first used acetate of lead and opium by the mouth with injections of nitrate of silver (five grains to the ounce) by the rectum, then pills of ipecacuanha and opium, one grain each, and camphor two grains, with poultices to the abdomen and a suppository of ipecacuanha and opium, two grains each, at bedtime. No improvement occurring, this medication was suspended and, at the suggestion of Acting Asst. Surg. H. H. Davis, a trial was made of large doses of ipecacuanha.

28th July.—Forty grains of ipecacuanha given in a bolus and recumbent rest and abstinence from fluids enjoined. A cataplasm at night over the seat of pain. The medicine was retained some hours, emesis occurring only after his effort to rise.

29th.—Omit bolus and give one of the combined pills every six hours and the suppository.

30th.—The bolus was repeated with suppository at night.

31st.—Taken into hospital and treatment continued.

Three days later, or on the seventh of the treatment, the tenesmus, bloody mucous discharges, fœtid smell and constant desire for stool disappeared and were replaced by a simple diarrhœa. The large doses were stopped at this point, but were afterward resumed in quantities varying from ten to thirty grains. The use of muriated tincture of iron, ten minims three times a day, was begun on the fifth day of the ipecacuanha treatment, and, as the case progressed, brandy and rare beef were freely used to rebuild his exhausted body. He was returned to duty 26th August.

This man was treated with ipecacuanha thirteen days, but Dr. Greenleaf regarded the disease as under control in six days from be-

ginning the large doses. He remarks: "Ordinarily he retained the ipecac. so long as the recumbent posture was preserved, but on the slightest deviation from it, even to raising the head to get a drink, emesis was produced, and, so far from any tolerance of the agent being established, I think the stomach became rather more intolerant as a condition of health was reached." Two and a half months later this man had an attack of acute dysentery, which was promptly controlled, and he has been perfectly well up to the date of the last report, 20th September, 1875.

I am also indebted to Dr. Greenleaf for an account of a case treated by Acting Asst. Surg. George C. Douglas, at San Juan Island, in the summer and fall of 1872. The daily notes were not supplied, but this abstract is condensed from the statement of Dr. Douglas.

CASE XXV.—A soldier of the 21st Infantry arrived with chronic dysentery, from Arizona. Dr. Douglas used ten-grain doses of ipecacuanha three times a day, in conjunction with numerous and various medicinal and sanitary measures, and satisfied himself by repeated experiments that that drug alone was the curative agent in the restoration of the patient's health. As often as it was suspended the disease returned, and it was found necessary to persevere in the treatment until the patient was thoroughly convalescent, and then to withdraw the medicine gradually.

CASE XXVI., from the notes of Dr. R. P. Myers, of the Georgia Infirmary, Savannah.

Jane M., negress, far gone with phthisis pulmonalis, and also suffering with a violent diarrhoea, entered the Infirmary November, 1875.

6th Nov.—One of the physicians gave her a powder of cinchona bark and opium, with milk punch and beef tea. This was continued for four weeks without improvement.

10th Dec.—Dr. Myers gave her cod liver oil, f. ʒij., and tartrate of iron and potassa, fifteen grains, three times a day. There was no improvement up to 16th, the bowels continuing to move so frequently that the nurse could not keep count of the stools, when Dr. Myers gave her ten drops of the wine of ipecacuanha every two hours, with an arrowroot and milk punch diet.

22d.—Decided improvement, the stools being reduced to three in the twenty-four hours.

26th.—Improving. Treatment continued.

1st Jan., 1876.—One stool a day.

Her bowels remained regular, ranging from one to two natural passages daily, until she died, about the middle of the month, with large cavities in the lungs.

This case seemed one of the most unfavorable of its kind, and yet the good effect of the medicine was very evident.

My own experience with chronic disorders of this sort has been very limited. As diarrhoeas are really collections of symptoms that

may point to very diverse causes, so one remedy is not indicated in all of them. The following cases, however, show some interesting features connected with the drug.

CASE XXVII.—J. H. has, 10th July, 1874, suffered some time with an obstinate and irregular diarrhœa, not dysenteric, apparently due to hepatic torpor with malarial depression. Nitro-muriatic acid, taraxacum, quinia, and other ordinary remedies were ineffectual. The bowels sometimes moved painfully six times in twenty-four hours. Ipecacuanha, in 20–30 grain doses, was given eight times, sometimes with laudanum and mustard and sometimes without, 10th–14th, inclusive. Five of these doses were followed by vomiting, varying in quantity from three ounces to nearly a pint. Returned to duty 18th, but relapsed and taken again under treatment 22d July. Six doses, from twenty to thirty grains each, were given between 22d and 29th, inclusive. Emesis occurred only once, to the amount of twelve ounces, during this interval. Ipecac. gr. vj. was given every six hours, without producing nausea, 30th July–2d August, inclusive. Eighty grains, in three doses, was given without emesis, between 2d and 5th. There was substantially no treatment between 5th and 14th August. At this time the tongue was large and flabby, and there were two or three loose, painless passages daily. Took twenty grains ipecacuanha, with laudanum and mustard, 15th, without vomiting, and the same 16th, when emesis followed. No treatment 17th–25th, inclusive. On 26th ordered quin. sulph., pulv. ipecac., ãã. gr. vj., ext. bellad. gr. $\frac{1}{4}$, four times a day. The man rapidly improved, and by 11th September joined his company for duty.

CASE XXVIII.—An officer returned to the post of Atlanta 25th August, 1875, sick with a violent diarrhœa that had already lasted several weeks. He had two years previously been greatly prostrated by a similar and protracted attack. This subsided under the prolonged use of ipecacuanha, in doses varying from one grain to fifteen. He was, however, obliged to take it at irregular intervals for nearly two months before he was fit for duty, and vomiting sometimes happened after the larger doses.

The two cases just recited are, perhaps, the least adapted for ipecacuanha of any among those in which I have used it. But they are recorded in order to fairly illustrate the different phases of my acquaintance with it.

To these I may add the memorandum of a case of chronic dysentery in Colorado several years ago, of which I kept no notes, where, after exhausting the ordinary round of treatment, I supplied the patient, a civilian, with a number of twenty-grain powders. There was no attempt to use them systematically, but one or two relieved him for the time whenever he saw fit to employ them.

Dr. G. S. King¹ reports the successful use of a heaping teaspoon-

¹ *Med. Record*,* Mar. 16th, 1868.

ful of the powder in a chronic dysentery that had resisted ordinary treatment. Dr. W. E. Whitehead,¹ U. S. Army, reported three cases of chronic dysentery successfully treated by large doses of ipecacuanha. He used in two cases fifteen grains, and in the other eight, each three times a day, gradually decreasing the doses; and under date of August 24th, 1874, he writes me: "Since that time I have treated many cases of chronic dysentery after the same plan, and always with satisfaction to myself." It appears also² that, at the English Hospital, Metz, during the Franco-German war, "the most obstinate and fatal disease the physicians had to deal with was dysentery of a very chronic character." After other methods, "the ipecacuanha treatment was then tried, and with fair success; doses of five to fifteen grains of the powder were given three or four times a day; it rarely caused vomiting, except at the first dose, sometimes not even then." Dr. Thorowgood³ reported to the Clinical Society of London the details of two cases of alarming and persistent chronic diarrhœa which, after the failure of various methods of treatment, subsided perfectly under the use of from two to five grains of ipecacuanha thrice a day. He "considered that these two cases of obstinate chronic disease having apparently no inherent tendency to spontaneous cure, were capable of well illustrating the action of the pulv. ipecac. The fact, also, of the remedy acting so well when given pure and uncombined was worth consideration." It may be interesting to supplement this record with this extract from Sir John Pringle's *Observations*.⁴ "Others have received benefit from ipecacuanha alone. Dr. Huck told me, that a soldier, after getting over the inflammatory state of the dysentery, was much reduced by a white-flux of the lienteric kind, and that after giving him several astringents without effect, he had at last succeeded by ordering him six grains of ipecacuanha in powder, to be taken every morning fasting; that this man was puked by the medicine for the first three or four days only, but that afterwards he took it without complaining that it made him sick."

¹ *Pacific Med. and Surg. Jour.*, 1870, iv., p. 11.

² *Med. Record*, 1871, vi., p. 384, fr. *Med. Times and Gaz.**

³ *Med. Times and Gaz.*, 1873, i., p. 643.

⁴ 7th ed., page 283.

On the other hand, Mr. Harry Leach^{1 2 3} insists upon the inertness of drugs, including ipecacuanha, in chronic dysentery, and Dr. Ward⁴ reiterates these views and lays stress upon rest and diet as the elements of cure. It is worth remembering that the cases under their treatment were chiefly seamen, who are peculiarly liable to scorbutus, in which, as elsewhere shown, diet is a prime essential. Dr. Ward⁴ supposes ipecacuanha is a powerful sedative upon the circulation, and Mr. Leach "cannot see what action a few grains of ipecacuanha are to produce upon so many square inches of ulcerated surface," implying that he looks for a direct topical influence. But no claim has ever been set up for its uniform success in that form of disease.

IV. Enemata of Ipecacuanha.

It is convenient at this point to break the simple narration of its remedial effects by a brief reference to the employment of the drug by the rectum, when it is found that the stomach will not tolerate it.

Waring⁵ gives Dr. Graves⁶ as authority for the infusion in enema being "a remedy of very considerable value, and not sufficiently appreciated by most modern practitioners." This I understand to apply to its therapeutical effects however desired. Dr. Wm. J. Johnson,⁷ in an account of a fearful epidemic of dysentery that occurred in Clay County, Georgia, in the summer of 1857, speaking of "enemata of ipecac. mixed with flaxseed tea or starch, to which laudanum was added," says: "I have seen the happiest effects follow the use of this remedy, when thus administered, and can confidently recommend it to the profession as of the greatest value. It promptly relieves the tormina and tenesmus, allays irritation of the mucous coat of the intestines, and checks sometimes for several consecutive hours, the evacuation from the bowels." He does not mention the strength employed nor the frequency of application. He did not give the drug by the mouth. Whittingham (p. 24 *ante*) expressly recom-

¹ *Half-Yearly Abstract*, xliv., p. 94, fr. *Med. Press and Circ.*,* Sept. 5th, 1866.

² *Practitioner*,* Dec., 1870.

³ *Med. Times and Gaz.*, Jan. 25th, 1873, p. 102.

⁴ *Ibid.*, Feb. 22d, 1873, p. 194.

⁵ *Op. cit.*, 2d Am. ed., p. 356.

⁶ *Clin. Lect.*,* i., p. 167.

⁷ *N. A. Med.-chir. Rev.*, Mar., 1858, p. 306.

mends this use of it in dysentery. Duckworth¹ reports a case of chronic dysentery cured by enemata of ipecacuanha, and further² says: "It is a fashion in India to employ an injection of the drug in dysentery. * * The plan was tried in the hospital [St. Bartholomew's] in the case of a woman, * * who was sinking apparently from uncontrollable dysenteric diarrhœa, * * ." It was successful after the usual remedies had failed. "No nausea or vomiting occurred." He also quotes a successful case in a child reported by Dr. Hillier,³ but adds that when attempted "in those very obstinate cases of diarrhœa which occur when the lower bowel is the seat of tuberculosis and ulceration" it failed. But on the contrary, M. Chouppe⁴ used it by injection "with very satisfactory results in the diarrhœa of tuberculous patients and in the choleriform diarrhœa of young children. In these cases vomiting was never observed." The preparation and dose that he prefers are these: Twenty grammes of the bruised root are boiled in five hundred grammes of water divided into three parts, each portion being boiled ten minutes. The three decoctions are mixed together and boiled down to two hundred and forty grammes, to which are added ten or twelve drops of laudanum. This is enough for two injections. For infants the dose is proportionately less and no laudanum is added. Two injections are administered daily; the first two hours before the first food, and the second three hours after the last meal. It is at least probable that this complicated method of preparation is unnecessary. Waring,⁵ indeed, asserts that boiling renders ipecacuanha inert; but that is probably an error, in view of the fact that the French usually employ (by the mouth) the Brazilian method, which involves its preparation with boiling water. Inflammation of the rectum, passing off when the treatment is suspended, frequently followed these enemata. M. d'Ornellas,⁶ using emetine, met with it in every case; M. Chouppe,⁶ using ipecacuanha found it in only five cases in thirty-four. Polichronie⁷ details six cases in the practice of M. Chouppe and M. Huchard where enemata of ipecacuanha were used in infantile cholera. There was one death in these, which was attributed to errors of diet. He

¹ *St. Barth. Rep.*, vii., p. 113.

² p. 117.

³ *Med. Times and Gaz.*,* Jan., 1864.

⁴ *Practitioner*, No. lxiii., July, 1874, p. 58, fr. *Bul. Gén. Thér.*,* June 15th, 1874.

⁵ *Op. cit.*, p. 356.

⁶ *Le Progrès Médical*, No. 28, July 11th, 1874.

⁷ *Op. cit.*, p. 19.

also¹ details one case of acute and three of chronic dysentery treated in the same way, one of the latter being unsuccessful. Dr. C. M. Jessop² extols the efficacy in dysentery of an enema of ten grains of the powder of ipecacuanha with half a drachm of laudanum in two ounces of decoction of arrowroot, or mucilage, three times a day; when the symptoms abate, twice, and finally once a day. Dr. J. F. Baxter³ reports an interesting case in a young lady who had recently had several sharp acute attacks and whose stomach he failed to persuade to tolerate the drug. Being critically ill, she was given "two scruples of ipecacuanha wine, fifteen minims of the tincture of opium, and one ounce of thin arrowroot, in enema. This gave her relief and sleep for four hours—the first she had had for several days." The treatment was continued, "and the following day she was considerably improved, and in four days more she was quite free from pain, purging or blood." She rapidly recovered. A writer in the *Medical Times and Gazette*³ reporting practice in the Madras General Hospital, after describing the ordinary use of ipecacuanha in dysentery there, adds: It "may also be used as a local application. Twenty grains rubbed up in water may be injected into the rectum, where it will act locally as a soothing remedy, and produce its constitutional effects as well."

It is unnecessary to accumulate evidence to show that in bowel affections at least, and presumably in other disorders, this method may be a valuable aid to the general treatment.

V. Painful but Simple Intestinal Affections.

While freely using ipecacuanha for the relief of dysentery, I was tempted to try it in other intestinal affections, and the following series thus grew up. I believe that some points here developed are new.

CASE XXIX.—W. H., in hospital, Atlanta, with a severe diarrhœa. The ordinary remedies not relieving him, and as he complained of a severe pain in the transverse colon, although no blood was passed nor were there any direct symptoms of dysentery, the experiment was tried of giving, with the tincture of opium and mustard as usual, twenty-five grains of powdered ipecacuanha at 9 P.M., 19th June, 1874. He slept well that night, felt much better the next day, was returned to quarters 21st, and to duty 23d June.

¹ pp. 29–31.

² *Am. Jour. Med. Sci.*, cxxv., Jan., 1872, p. 254, fr. *Ind. Med. Gaz.*,* July–Sept., 1871.

³ Apr. 11th, 1874, p. 407.

CASE XXX.—B. R., admitted, Atlanta, with a severe diarrhœa, 19th June, and, complaining almost identically with the preceding case, received two large doses of ipecacuanha on 20th. One of these induced some vomiting, but the severe pain in the colon ceased, although the diarrhœa lingered a number of days. Returned to duty 9th July, 1874. (See Case V.)

CASE XXXI.—R. B. G. is now well advanced in the first week of an attack of bilious remittent fever, at Atlanta.

6th July, 1874.—Has had four or five painful fluid passages from the bowels during the day; tongue brown and furred; has taken no purgative for a day or two; anticipates from his present feeling a restless and sleepless night. 9 P.M.—Gave tr. opii $\mathfrak{m}$.xxv., followed by pulv. ipecac. gr. xxv. and a sinapism.

7th July, 9 A.M.—Slept well all night, and had one large, soft, blackish operation, without pain, at five o'clock. Is very comfortable, has no abdominal uneasiness, and tongue is cleaner. P.M.—Had some abdominal pain, and was therefore ordered twenty-five grains of ipecacuanha at nine o'clock. This was imprudently given without laudanum or mustard, and, being restless and drinking a little citric-acid-water, he threw up the medicine in a few minutes. The vomiting was of short duration and he afterwards slept soundly. He was very comfortable the next morning, and had one loose, yellowish passage about noon without the intervention of any laxative. This patient passed successfully through a severe attack of fever, but this drug was not employed with him again.

CASE XXXII.—Captain F. is of delicate constitution and is so readily nauseated that he can excite vomiting by a mental effort. He is subject, especially in warm weather, to attacks like the following, which generally last for more than one day. On the morning of 25th July, 1874, which was very hot, attendance at a court-martial, in full uniform, for several hours, fatigued him very much. Between twelve and one o'clock he went into the town of Atlanta, and was suddenly seized with nausea and cramp-like pain in the bowels, compelling his immediate return to the post. He felt better after resting, but on sitting down to dinner, and before eating, the pains returned with increased violence, obliging him to lie down. A flannel saturated with laudanum and spirits of camphor was applied, and the suffering subsided in half an hour, when he fell asleep, awaking in two hours in a profuse perspiration. (The room in which he was lying was quite close.) When cooler he sat up, but instantly the pain returned with great violence, accompanied by nausea. At this time I first saw him. He was at once given twenty grains of powdered ipecacuanha in a very little water, with no adjuvant treatment except enjoining absolute abstinence from motion, conversation, food or drink. He was not told the name of the medicine. In seventy minutes he vomited rather less than half a pint of yellowish fluid, with what appeared to be a part of the powder floating upon it. The nausea was of no duration, and the vomiting was at one effort and not severe. He began to feel easier soon after swallowing the medicine, and supposed that he had taken an opiate. After vomiting he felt entirely relieved, and two hours later drank some tea, which he retained. He slept quietly through the night, and went to duty in the morning. A large semi-fluid operation from the bowels (color not noted) occurred at 9 A.M. Captain F. volunteered the statement that no previous attack had yielded so readily. (See Case XXXVII.)

In the case just noted there was no known error of diet, but the exciting cause appears to have been fatigue and solar heat acting upon a delicate subject.

The next two cases illustrate the ease with which the ipecacuanha frequently is retained, and the slight nausea that happens even when there is emesis; and I think that the change in the character of the stools and in the accompanying sensations may fairly be attributed to it.

CASE XXXIII.—C. S. This man had been ill several weeks with a very mild and open attack of typhoid fever, at Atlanta. For some days he had had marked looseness of the bowels, generally having two alvine discharges in the night and three or four in the day. These gave no especial pain.

29th August, 1874.—He reports that for the last thirty-six hours he has had very severe and increasing pain with each passage, that the stools had become more consistent, and that he has had sharp suffering extending across the abdomen near the umbilicus, while the actual motion had been accompanied by excruciating pain, (the description reminding one of ulcer of the rectum,) and been followed by tenesmic straining. He has also had several ineffectual promptings to empty the bowels, with straining. 6 P.M.—Gave ipecac. gr. xx., opii gr. j., in pills.

30th.—Felt a little nausea soon after taking the medicine, and again about 8:30 P.M., upon getting up to urinate, but neither sensation was severe, and no sinapism was required. Slept perfectly well from taps to reveille, which he had not done before during his illness. Had a copious, foaming, light yellow dejection, without pain and with but very little discomfort at 11 A.M. Had no other stool during the day. 9 P.M.—Gave ipecac. gr. x., opii gr. j., in pills.

31st.—Again slept well all night, and had no operation through the night or to-day. No abdominal pain.

1st September.—Had one copious, painless discharge, similar to that of 30th, in the night, and another at 7 A.M. Slept well and feels materially better in all respects.

None of the symptoms for which ipecacuanha was given in this case returned.

CASE XXXIV.—B. T. A., in the convalescent stage of a mild but well-marked attack of typhoid fever, at Atlanta. Complains that for several days his stools have been costive, and that he has had great distress and pain when the solid, scanty dejections were voided with straining.

31st August, 1874.—Gave experimentally, at 3 P.M., ipecac. gr. xx., opii gr. j., in pills. 7 P.M.—Has not been nauseated, except when lying on the left side. Feels very comfortable.

1st September.—At nine o'clock last night had a severe cramp-like pain in the stomach, which was relieved by a sinapism, but there was no nausea. Bowels not moved, either in the night or day. 9 P.M.—Gave tr. opii ℥.xv., and fifteen minutes later, ipecac. gr. xx., in pills.

2d.—Felt no nausea last night and went to sleep promptly. Was awakened at 10:30 P.M. by vomiting without preceding nausea. "Threw up less than a pint of sour or bitter fluid. It wasn't much. Don't know what made me vomit. Didn't feel sick, but I waked up vomiting. Didn't feel sick afterwards. Went to sleep pretty soon." He slept the remainder of the night. As his bowels had not yet moved, gave him ol.

ricini, f. $\bar{3}j.$, at 10 A.M. This was followed by three passages during the day, the first being of natural consistence and the others thin. None gave pain. There was no further intestinal trouble in this case.

The following cases are the ordinary but painful colics of which soldiers so frequently complain in the hot weather. I quote the most of the cases where I took notes, because, although it is common enough to give ipecacuanha with the view of ejecting indigestible food, I know of no examples where it has been administered with the distinct view of being retained without nausea. All but one occurred at Atlanta in the summer of 1875.

CASE XXXV.—J. C. complained of violent pain and cramps in the abdomen, 8th May, 1875. He was given twenty grains of ipecacuanha and twenty minims of laudanum and was required to lie down. There was prompt relief without vomiting. Duty, 10th May.

CASE XXXVI.—C. H. L. had violent abdominal pain like the last case. Like him he was given twenty grains of ipecac. and twenty minims of laudanum with recumbent rest, and relief promptly followed. Duty, 11th May.

CASE XXXVII.—Captain F., who is subject to colic in hot weather, had a severe attack of abdominal cramp the first of June, 1875. He was given fifteen grains of ipecacuanha and three-fourths of a grain of opium at bedtime. He slept well all night and awoke free from pain in the morning. He had no nausea. (See Case XXXII.)

CASE XXXVIII.—T. T., for a severe colic, was given fifteen grains of ipecacuanha and ten minims of tincture of opium, 2d June, 1875. He had no nausea, the pain disappeared, and he was returned to duty the next day.

CASE XXXIX.—D. M. This man was admitted hospital 10th June, 1875, with a complaint of very severe abdominal pain without diarrhœa, following, as he supposed, the unaccustomed use of beer. Temperature, 7 A.M., 98°. R. Ipecac. gr. xv., tr. opii $\mathfrak{m}.$ xv. He fell asleep soon after taking this, and awoke feeling much better but not entirely relieved. At 12 M. given ipecac. gr. x., opii gr. ss., when in half an hour he vomited a quarter of a cupful of fluid.

11th.—Slept well. Duty.

CASE XL.—W. B. H., with colic, 31st August, 1875. Given ipecac. gr. xv., tr. opii $\mathfrak{m}.$ x., at 9 A.M. Did not vomit, the pain was relieved, and he slept the most of the day. 9 P.M.—R. Ipecac. gr. x., opii gr. ss. No nausea.

1st September.—The bowels being bound, given Rochelle salts $\bar{3}ss.$

2d.—R. Ol. ricini $\bar{3}j.$, tr. opii c., f. $\bar{3}ss.$

4th.—Duty.

CASE XLI.—P. N.; Atlanta, August, 1875. Had severe pain in the bowels, with six or eight watery discharges during the night and morning, and vomited several times. Being the Hospital Steward, he took of his own motion ten grains of ipecacuanha and half a grain of opium at noon, and laid down for two hours. The pain and discharges then ceased, without nausea.

CASE XLII.—J. F. complained at noon, 6th March, 1876, Savannah,

of severe griping pains and very frequent watery passages. Given fifteen grains ipecacuanha with a little water and directed to lie down. Retained this until drinking a cup of tea three or four hours later, when he vomited. 9 P.M.—Complained of excruciating pain, "as if he would die," and incessant discharges from the bowels. These were thin and yellowish with a curdled milk appearance. Temperature, 102.4° . Admitted hospital and given twenty grains of ipecacuanha with ten minims of tincture of opium, and a mustard plaster was applied. He soon removed the sinapism, but there was no nausea. At 10 P.M. temperature 101° , the pain was much less, and he had had but two passages. Given ten grains more without opium, and supplied with two more five-grain pills to be taken, if he should need them, in the night.

7th Mar.—Temp., 7 A.M., 99° . F. had taken the remaining ten grains at 3 A.M., when his bowels moved. He had slept fairly, had no pain and felt pretty well but weak. He was given no more medicine, and the next day was returned to duty.

We have in this case thirty grains of ipecacuanha taken within an hour, and ten grains more a few hours later, all without vomiting. The first twenty grains was followed by the fall of 1.4° in temperature, and a marked diminution of pain and cessation of purging. The man attributed the attack to sleeping in a damp cell in the guard-house—which is doubtful.

The most of the cases just cited were due, as I suppose, either to high temperature alone or to comparatively severe diurnal changes, and were entirely independent of imprudence in diet. Such cases are probably common in the experience of all who have had charge of soldiers or careless laborers, and deepen in shade until they merge into cholera morbus. I presume that all physicians can recall instances where ipecacuanha, given for the express purpose of emesis, has failed to vomit, but at the same time the patient has been relieved from pain without the rejection of the presumed offending material. I have several such cases in recollection; but, as no notes were taken, refrain from quoting from memory.

VI. Cholera Morbus and Cholera Infantum.

CASE XLIII.—W. B. O. was taken on the sick list jaundiced from a functional hepatic derangement, 16th June, 1874. He steadily improved until 27th, when he appeared at sick call startlingly changed in aspect and condition. His face was haggard and drawn, he was so weak as scarcely to be able to stand, and he asserted that the greater part of the previous day and night he had suffered frequent and painful purgings and vomitings. He was at once (6:30 A.M.) given a bed in the hospital, but no medicine was prescribed. On visiting him at eight o'clock he said that he had had seven stools and as many attacks of vomiting within the past hour and a half. These were painful, the discharged matters were dark brown, there were constant abdominal pain and great thirst, his face was haggard and pinched, his skin was cold and bluish, his pulse very

feeble, and his general condition was one of great prostration. Having Cases XXIX. and XXX. in mind, where severe abdominal pain, although much less in degree, subsided after the use of ipecacuanha, and believing that this drug exerted a special influence upon the intestinal excreting surface and possibly upon the liver, I regarded this as a fair case in which to employ it, provided it could be retained. He was therefore given at once a preliminary dose of twenty minims of laudanum. In a few minutes he threw up at least part of it, but twenty-five grains of ipecacuanha was, nevertheless, administered and a sinapism was applied. He retained the medicine, and the vomiting and purging at once ceased. By noon he felt remarkably better and was very bright. One copious operation without pain occurred in the middle of the day. Twenty grains of ipecacuanha was given at 2 P.M., but, taking a cup of tea a couple of hours afterward, a part of it was then thrown up. At night he said he "felt like a new man," and he really looked like a different person. There was no further trouble in this case from this acute attack; convalescence progressed regularly, and he was returned to duty in a few days.

Having been led from its successful use in violent irritation of the colon without bloody discharges, (Cases XXIX., XXX.,) to employ it in the case just reported, (XLIII.,) which resembled cholera morbus, where the very serious gastric and intestinal disturbance at once subsided under its influence, reflection upon its apparent mode of action led me to think that it might prove of service in genuine cholera morbus, and also that it would be worth a trial in Asiatic cholera. An early opportunity occurred to test it in the former disease.

CASE XLIV.—E. B. was reported as very ill in his quarters, 9 A.M., 5th July, 1874. I found him lying on his bunk, complaining of great thirst and of severe cramps in his legs and feet, which men were rubbing. At this time his face was shrunken and bluish, his hands were blue and the ends of his fingers wrinkled, his skin was cold and clammy to the touch and was bathed in cold perspiration, and his pulse was extremely feeble. I think that he might fairly be called in a state bordering upon collapse. He had fallen to the ground from the sudden and severe seizure of cramps in the legs a few minutes before. His Captain saw him while he was yet lying on the floor, and in describing him said: "His hands and face were blue, he appeared shrunken, he had severe cramps, and he looked to me like a corpse or a dying man." His general health had been good up to the preceding night; ate for dinner on 4th fresh mutton and black-berry pie, and knows of no other exciting cause. About 10 P.M., 4th inst., was attacked with a painless diarrhœa, and between that hour and reveille (dawn) he had eight or ten dejections, the first two or three of which were copious. He does not know their color. He also had four or five attacks of vomiting; does not know its appearance as it was discharged out of doors in the dark. At sunrise he felt better and did not think it necessary to report sick. Drank coffee for breakfast, threw it up and the diarrhœa returned. Was intensely thirsty but vomited all the water he drank. About 9 A.M., while walking to a water-pail he fell to the floor in a severe cramp. I then saw him and had him immediately carried to the hospital and withheld all fluids.

9:15 A.M.—Admitted hospital in the condition already described. Had epidemic cholera been present, this would probably have been con-

sidered a case of that disease. The Steward, who had seen cholera Asiatica, was at once reminded of it by his appearance. Temperature in the mouth 103.8° F.; pulse not counted, but very feeble.

9:30.—Gave twenty minims of laudanum in an ounce of water, by error for half an ounce, and a sinapism was applied over the stomach. He almost immediately vomited eight or ten ounces of watery fluid, but nevertheless took, at 9:50, pulv. ipecac. gr. xxv., aquæ f. $\mathfrak{z}$ ij.

10:15.—Skin warmer, no cramps, no vomiting, pulse fuller.

10:30.—Vomited six or eight ounces of fluid like the first.

10:45.—Had a thin, light-colored, sour and acrid-smelling discharge from the bowels, and cramp in the left foot.

11.—Took pulv. ipecac. gr. xx., aquæ f. $\mathfrak{z}$ ij.

12 M.—Temperature in the mouth 97.6° F.

1 P.M.—Vomited eight ounces brownish liquid; bowels moved soon afterward, much as before.

1:30.—Felt quite easy; free from all pain; skin warm; face bright; pulse much better, and general condition good.

2:45.—Vomited about two ounces yellowish fluid.

4.—Drank some tea; rejected the first part and retained the latter; retained also some bread.

5 P.M.—Pulse, skin, and general condition natural; feels quite well and hungry; tongue a little furred; temperature 99° . To stay in bed the remainder of the day, but to take no more medicine.

6th July.—Feels perfectly well, but is retained at the hospital as a precaution.

7th July.—Remained well all day yesterday. Duty.

So far as I know, this is without precedent as to treatment. A single case does not afford legitimate ground upon which to reason, when we remember how wonderful are some of the recoveries that follow the unassisted efforts of nature. But cases grow in value as they increase in number, and there are some interesting confirmations of this practice.

The following is an extremely interesting example of the use of the drug in cholera morbus, where, although it was employed simply for its special emetic effect, the practice seems to entirely confirm that just reported, and the views yet to be set forth. I was not aware of this paper when Cases XLIII. and XLIV. occurred. It is reported by Mr. John Higginbottom,¹ under the title "Ipecacuanha, in Emetic Doses—as a Powerful Restorative in some cases of Exhaustion and Sinking," and is reproduced in detail on account of its intrinsic interest and from the comparative inaccessibility of the original. Mr. Higginbottom, seeking to set forth its restorative effects, says:

CASE XLV.—"In the year 1814, I was first led to see the extraordinary beneficial effects of ipecacuanha as an emetic, in a female forty years of

¹ *Lancet*, 1845, i., p. 732.

age, who was in a sinking state in the last stage of cholera [morbus]; her countenance was shrunk, extremities cold, cramp in the legs, and other symptoms of impending dissolution. I had previously attended two similar cases, where I had given opium, brandy and medicinal cordials, and both patients died. I was induced, in this instance, to give a scruple of ipecacuanha, from having frequently seen the good effects of it in the early stage of the disease. After the lapse of two or three hours, I again visited my patient, fearing I should find her dead, but, to my great pleasure and surprise, so great a change for the better had taken place as to appear almost incredible; the whole of her body was of a natural warmth, the dangerous symptoms had disappeared, and she made no complaint, except that she was very weak. She had no further unfavorable symptom of the disease and was soon convalescent. My confidence in the ipecacuanha, as a remedy in such cases, has now [1845] been confirmed during the practice of thirty years; the purging, vomiting and cramp often entirely cease after the emetic operation of the ipecacuanha, but I have thought it proper to give, in about two or three hours after the emetic, a pill, with a grain of opium and five grains of blue pill, to allay any remaining irritation of the stomach and intestines, and an aperient with one scruple of rhubarb and two of sulphate of potash, to assist the natural action of the bowels, and a simple saline effervescent draught every two or three hours afterwards; weak tea, well-boiled gruel, milk, with sago or arrow-root as nutriment, and diluents."

This case appears to be typical, and was reported not as being unique but as an example. The facts there set forth seem to me worthy of the most thoughtful consideration.

The same paper contains another case which, although not of cholera morbus, is introduced here for convenience of reference. It is in a manner a link connecting this and Sections V. and XVIII. The following is an abstract of it.

CASE XLVI.—A very delicate lady, aged 23, who, undergoing a severe labor with puerperal convulsions (for which twenty ounces of blood was taken), and embryotomy also having been performed, "was exceedingly low afterwards." The record reads: "About the ninth day she complained of severe pains in the course of the colon, particularly at the caput coli and the sigmoid flexure." "Mustard plasters were applied and active purgatives, with benefit, but a continued vomiting came on attended with considerable lowness. Dr. Hutchinson was called in to visit her with me. Injections of half-a-pint of beef-broth with half an ounce of turpentine were administered every four hours; a common blister of cantharides was applied to the scrobiculus cordis; plain gruel and other light nutriment was given as most likely to remain on the stomach. The vomiting still continued; the turpentine injections occasioned much pain after they were administered, and there was an alarming increase of exhaustion and sinking. In this case it occurred to me that an emetic dose of ipecacuanha was the most probable remedy to rally the sinking powers and, with the concurrence of Dr. Hutchinson, I gave half a drachm and remained with her during its operation. A fuller vomiting occurred than I could have expected although it was small in quantity, yet it occurred to me that the natural effort had long been exerted in

vain to accomplish what the ipecacuanha directly effected—that of completely emptying the stomach. I remained with my patient an hour, and left her somewhat better. After I had gone she turned herself on the left side and remained so still for several hours as to alarm her husband, who sent for me directly, fearing she was dying. I found her pulse much improved; she was still lying on her left side; the sickness had abated.” She rapidly and fully recovered.

It is ungracious to criticise so valuable a record, but it appears to me that the action of the drug and, in a degree, the condition of the patients have been misinterpreted by the reporter. In the first or cholera morbus case, which is set up as a precedent, “confirmed during the practice of thirty years,” it is probable that the use of the drug “as an emetic” was an unnecessary exhibition of its powers. If the same quantity had been given with the precautions that now are taken, it is altogether likely that the same effect, without the vomiting, would have been attained. It seems to have been given as a last resort, because emesis often relieves the disease in its earlier stages by removing irritating ingesta which may then be the exciting cause. But here the conditions were wholly different, for the patient “was in a sinking state in the last stage of cholera.” Nor is there any record of the ejection of such offending matter. The appropriateness of the subsequent medication by opium, blue pill, salines, etc., must depend upon the individual cases. But even in Mr. Higginbottom’s opinion it is only secondary and incidental.

In the other case it really appears that the emesis had nothing to do with the cure, for that function had repeatedly been exercised without benefit. As the case advanced, it is recorded that “a continued vomiting came on, attended with considerable lowness.” This was clearly a pathological condition, and it was chiefly to relieve it, the sign of marked vital depression, that the physicians’ later efforts were directed. There is no history of irritating ingesta here, and to suppose that the pathological vomiting was cured by the artificial vomiting would be the purest homœopathy. Moreover, it is expressly noted that, although it was fuller than could be expected, “it was small in quantity.” I must, therefore, in this case also, regard the vomiting as incidental. It seems to me that the puerperal condition of this patient is chiefly significant in that it damaged her general health and shocked and depressed the sympathetic, and that the suffering in the colon, which made no special impression on the reporter, and the intestinal disturb-

ance generally, bring the case into direct relation with some of those that make up the original reports of this paper.

I have had no opportunity to treat cholera infantum since my attention has been drawn to the peculiar powers of ipecacuanha; but in the summer of 1874, as cited in Section IV., it was successfully employed in Paris. Polichronie¹ says that MM. Bourdon and Chouppe followed Trousseau in using ipecacuanha in infantile cholera, except in that they employed the channel of the rectum instead of the stomach. I have not been able to find Trousseau's paper or experience on this subject, but I presume that that reference is correct. At all events, as already noted, ipecacuanha injections have been very satisfactorily employed in cholera infantum and choleriform diarrhœa.

The classes of cases heretofore reported have a regional and an obvious pathological connection. Those that follow are apparently diverse, but I hope to trace an affiliation between their causes and to show that they respond to one controlling power.

VII. Uterine and other Hæmorrhages.

I have no personal experience with the hæmostatic properties of ipecacuanha; but that it possesses such there is authentic testimony, a part of which is here offered.

CASE XLVII.—Mr. Higginbottom² cites the case of a lady who was sinking rapidly from post partum hæmorrhage in 1827, whom he had previously attended in a similar condition in 1821 and 1823, using then various remedies; and having observed that in the former instances "there was no amendment until she had ejected the contents of her stomach" he gave her half a drachm of ipecacuanha as an emetic. A full vomiting followed and the "hæmorrhage ceased directly and did not return."

CASE XLVIII.—Dr. J. B. Read³ reports a case of which the following is an abstract. In October, 1858, he found a recently delivered large and stout Irish woman to whom he had been hastily called, lying with open eyes that were insensible to light, and an almost imperceptible pulse, in a pool of blood that had soaked through the mattress. The uterus was relaxed and soft and extended nearly to the epigastric region. It contained no clots, but the blood was pouring out in a stream. He gave ergot and stimulants freely, lowered the head and elevated the thighs and legs, kneaded the uterus between the closed hand in the organ and the other on the outside of the abdomen; alternate douches of hot and cold water were used, cold water was poured from a height on the abdomen, and ice was passed into the uterus and iced salt into the rectum. "A per-

¹ *Op. cit.*, p. 19.

² *Loc. cit.*

³ *Savannah Jour. of Med.*, Mar., 1859, i., No. 6, p. 361.

severing use of these remedies and the repeated administration of the ergot was followed by no good result, the hæmorrhage still continued, the uterus remained flaccid, and there was not the slightest effort at contraction." He then, on the strength of Mr. Higginbottom's case, sent for ipecacuanha, continuing his efforts to bring on contraction. One hour from the time he first saw her, her condition then being worse from the constant drainage of the vital fluid, he administered half a drachm of the powder which, owing to her extreme weakness, was swallowed with great difficulty. With one hand in the uterus and the other on the abdomen, he awaited the action of the medicine. In five minutes vomiting occurred, and with the very first effort the uterus contracted suddenly and firmly, expelling the hand from its cavity. Her pulse became stronger, color returned to her lips and face, and she exclaimed "I feel all right." The vomiting continued at intervals for about ten minutes. The patient remained pallid and bloodless for a long time, but recovered under the use of strychnine, nutritive diet, and abstinence from alcohol.

CASE XLIX.—Dr. Read has related to me the particulars of another terrible case in his practice, very similar in all respects to the one just reported. *

He further informs me that since his first case of the kind just recorded, he has habitually and with uniform success used ipecacuanha to control post partum hæmorrhages, until of late years he has substituted electricity as more convenient and equally efficacious. But he always carries ipecacuanha with him to a case of labor as a matter of precaution, and has employed it as late as the spring of 1876 to check a puerperal hæmorrhage.

Chapman¹ says: "Ipecacuanha is an exceedingly important article in hæmorrhages," and he thinks that it is quite equal and sometimes superior to acetate of lead. Tyler Smith,² in a *Clinical Lecture on Parturition* says: "2. Ipecacuanha is another medicine which is sometimes given in uterine hæmorrhage. This medicine by its emetic action excites contraction of the abdominal muscles and compression of the uterus, which in turn may re-excite some amount of uterine reflex action, but over and beyond this it appears to have a special action upon the uterus, increasing its contractile power beyond what we could imagine to occur from the merely secondary effects of vomiting." This is a direct recognition, by a competent observer, of its possession of virtues beyond, if not independent of its emetic quality.

In internal hæmorrhages generally, Mr. Trenor³ "gives it in small

¹ *Therapeutics*, 6th ed., i., p. 117.

² *Lancet*, 1848, ii., p. 658.

³ *Waring*, 2d Am. ed., p. 360, fr. *Dublin Jour.*,* xviii., p. 481.

doses so as to produce nausea, without actual vomiting; and that procedure was attended with marked benefit, arresting the hæmorrhage and restoring heat and life to patients who were in a state of collapse from excessive loss of blood." That is asserting for it very high therapeutical virtues: but the witness is perfectly trustworthy and his testimony has not been impeached. Dr. Osborne¹ gives in uterine hæmorrhage and menorrhagia twenty grains of the powder "in the evening, followed by an acidulated draught in the morning. The discharge usually ceased in twenty-four hours; and if a relapse occurred, a repetition of this emetic never failed to render the cure permanent." Dr. Duckworth² states that Mr. Higginbottom³ reports cases of post partum flooding "where it checked the bleeding after ergot of rye had failed." In the *Manual of Materia Medica*,⁴ abridged from Pereira's *Elements*, it is stated: "In bronchial hæmorrhage, the efficacy of ipecacuan has been greatly commended. A. N. Aasheim, a Danish physician, gave it in doses of one-fourth of a grain every three hours during the day, and every four hours during the night. In this way it excites nausea and sometimes even vomiting. It checks the hæmorrhage, alleviates the cough, and relaxes the skin."

The most definite and weighty testimony to the hæmostatic property of ipecacuanha by an authoritative teacher is Trousseau's, where, treating of hæmoptysis, he says: "When the parenchymatous hæmorrhage is obstinately recurrent, ipecacuanha [in small doses] is a remedy which seldom fails. I am not at present referring to ipecacuanha administered as an emetic, which is more to be relied on in what is called bronchial hæmorrhage." He thus distinctly sets forth this power as independent of emesis in at least one class of cases. He then cites a case of the other (bronchial) sort, where a patient "twice within the space of six months had frightful hæmoptysis: twice it was immediately arrested by four grammes (rather more than a drachm) of powder of ipecacuanha, administered within the space of half an hour in such a way as to cause violent vomiting." He also details several other cases with the same result and proceeds: "Should, however, there be a relapse of the hæmoptysis, the use of the ipecacuan must

¹ *Ibid.*, fr. *Trans. Irish Col. Phys.*,* v., p. 18.

² *St. Barth. Hosp. Rep.*, vii., p. 121.

³ *Brit. Med. Jour.*,* Feb., 1869.

⁴ *Phila.*, 1866, p. 613.

be resumed. I never hesitate in such circumstances to return to it two or three times, if necessary, and I have never seen the least inconvenience result from the proceeding. Gentlemen, this is not a new method of treatment. For the last two centuries, physicians have lauded the Brazilian root as a remedy in all forms of hæmorrhage; and Baglivi [1696] says: '*Radix ipecacuanhæ est specificum et quasi infallibile remedium in fluxibus dysentericis, aliisque hæmorrhagiis.*' Nevertheless, gentlemen, the hand trembles when it administers this remedy for the first time in the hæmoptysis. * * One might expect such treatment would cause the hæmoptysis to return in a much more profuse degree; but in place of this it is stopped in nearly every case. Here is one proof more of the small reliance to be placed on theoretical explanations, and of the value of empirical facts, without which, indeed, therapeutics would be a nullity."¹ It may not be presumptuous to suggest that the time is approaching when theory as well as empiricism will support the practice.

Duckworth asserts² that Trousseau and Pidoux regard it as a styptic when used in internal hæmorrhages, and cites³ an interesting collection of authorities on this point, and reports three successful cases of his own where small doses were used. Dr. C. D. Phillips⁴ asserts: "Hæmorrhage in the early stage of tubercular phthisis, and in most stages of this disease, when produced by engorgement of the bronchial mucous membrane, and accompanied by little or no acceleration of pulse or increase of temperature, is often readily stopped by ipecacuanha. In hæmatemesis arising from vicarious menses, and also in some cases of menorrhagia, it is very useful." The whole of his paper is a valuable exposition of the uses of ipecacuanha. Hertz,⁵ referring to its praise by Graves and Trousseau, and more lately by Peter, Massina and H. Weber, makes the significant remark that its "effect upon the heart and vascular system is as yet uncertain and but little understood." However, he discourages its use from the danger of new hæmorrhages being produced by the jarring of vomiting.

¹ *Clin. Med.*, Eng. fr. 3d Fr. ed., i., p. 540.

² *St. Barth. Hosp. Rep.*, v., 1869, p. 220.

³ vii., 1871, pp. 117-121.

⁴ *Braith. Retros.*, ix., Jan., 1870, p. 243, and, abridged, *Am. Jour. Med. Sci.*, cxvii., Jan., 1870, p. 238; fr. *Practitioner*,* Nov., 1869, p. 277.

⁵ *Ziemssen's Cyclopædia*, Am. ed, v., p. 319.

The *Medical Record*¹ says: "Dr. John Shrady, of Harlem, N. Y., has successfully exhibited ipecacuanha in several severe cases of epistaxis, especially in the form associated with chronic alcoholism."

CASE L.—The latest detailed account of this feature of the medicine that I have seen is by Dr. William Martin,² who reports a case of wound of the right tonsil, to the apparent depth of two-thirds of an inch, by a bamboo pipe-stem. No serious immediate bleeding occurred, but twenty-one hours afterward there was "positive jutting arterial hæmorrhage from back and upper surface of the wound, which altogether presented a most discouraging and alarming appearance." There was general tumefaction, headache in the region of the lateral meningeal arteries, and the patient was "in a state of prostration and fear." Twenty grains of chloral and a gargle containing one part in four of muriated tincture of iron were prescribed. Nine hours later there was no change, except that suffocation was complained of, and Dr. Martin writes (the italics are his) "(and being quite certain that hæmorrhage was not from the carotid) I gave two-grain doses of ipecac. every hour, till third dose caused gentle vomiting, and with it immediate contraction of the tonsil (thus lessening wound) and causing hæmorrhage at once to stop." The bleeding did not recur, and no other hæmostatic was used. Dr. Martin adds: "* * I am quite convinced, from the experience of nineteen years, that the theory and practice of my lamented teacher, Sir William Lawrence, Bart., that in such cases where capillary hæmorrhage occurs and the position of the main artery dangerous, that after the administration of *small doses* of ipecac., until a *gentle* vomit is caused, natural plugging follows, contraction of tissues and safety is insured, for in such cases, and under such treatment, muscular contraction *never* fails. I have tried it many times (even so late as last week) in obstinate contraction [?] of uterus and never experienced ill effects."

I am told that the homœopaths use it in quarter- and half-grain doses as their most valuable hæmostatic; but this I do not know certainly.

VIII. Excessive Perspiration.

I supposed that ipecacuanha would be useful in abnormal perspiration, from considerations that will be set forth later, but I have not had very favorable opportunities for its trial. As far as they go the cases are satisfactory.

CASE LI.—W. M., a negro scavenger at the Post at Atlanta, complained, 29th January, 1875, of nightly pain proceeding from the pit of the stomach toward the chest, followed by cold sweats, considerable in quantity and very debilitating. His health otherwise is good. He was supplied with a quantity of two-grain pills of ipecacuanha, and was directed to take one every four hours. He still felt weak, but the sweats had ceased on the third of February, and by the sixth he had no unusual perspiration, and felt perfectly well.

¹ vi., Dec. 1st, 1871, p. 464.

² *N. Y. Med. Jour.*, xiv., 1871, p. 177.

CASE LII.—P. Y. applied for relief from nightly sweating that was harassing him, at Atlanta, 7th September, 1875. He was supplied with a number of one-grain ipecacuanha pills, and was directed to take one every four hours. A week afterward he reported that the abnormal perspiration gradually subsided as he took the medicine, and that he was then free from it.

CASE LIII.—W. D. presented a perfectly duplicate case to the last, except in date, which was 11th October, 1875.

CASE LIV.—C. B., convalescent from typhoid fever, complained, February, 1876, at Savannah, of annoying sweats that occurred nightly. He had suffered thus for nearly a week before mentioning it. He was at once given one grain of ipecacuanha four times a day, and the perspiration immediately diminished, disappearing the third night. The medicine was continued a week, and the symptoms did not return. There was no other change in his mode of living.

A more valuable record is M. Chouppe's report in *Le Progrès Médical*¹ of its successful use in ten out of twelve cases in the excessive perspiration of phthisis. Consult also Polichronie.² Graves³ remarks that in the profuse perspirations of hectic a few grains of Dover's powder at bedtime will stop them.

IX. Some Forms of Dyspepsia.

It is understood that Daubenton, a French naturalist, first recommended small doses of ipecacuanha in torpid digestion in a tract published in 1785 where, as quoted by Dr. George Budd,⁴ he says: "I have repeatedly experienced beneficial effects from it in my own person that surpassed my expectations, and I have prescribed it to many others with whom it has had similar success." He gave it fasting, in quantities varying from a quarter of a grain to two grains, so as to produce no nausea. Early in this century Dr. Buchan translated the pamphlet into English "as a practical improvement in the art of medicine," and from his own experience warmly commended the treatment. This practice was for a time much employed and then fell into neglect, as Dr. Budd believes because it was used without discrimination. He thinks⁵ it has much efficacy as applied to the evils of slow digestion, and distinctly advises it in rightly distinguished disorders of that sort. Ipecacuanha, indeed, is an ingredient in most of the ordinary aperient

¹ 1874, Nos. 12, 16, 25, 28, 29, 30.

² *Op. cit.*, pp. 46-50.

³ *Clin. Lect.*, i., p. 488.

⁴ *Diseases of the Stomach*, Am. ed., 1856, p. 233.

⁵ p. 234.

or dinner pills; although, perhaps, it is generally prescribed as an adjuvant in laxatives without any very clear apprehension of its special function. A gentleman of large experience assures me that in small doses it is almost a specific in the sick headache of children. I have in several instances, where I have not taken notes so as to be able to cite specifically, employed small doses of ipecacuanha in atonic dyspepsia, and I think that those who habitually prescribe it in disorders of digestion will, upon analysis, observe that it has succeeded best where there has been gastric or intestinal asthenia. One case, however, I may give in detail.

CASE LV.—In the winter of 1874-5 I was consulted by a lady whose health had been delicate for several years, but whose immediate and pressing symptom was a dyspepsia that showed itself in a poor appetite and vomiting of food after nearly every meal. For some reasons I was inclined to believe these due to uterine congestion or displacement, and as analogous to those accompanying pregnancy. (Compare with Case LXI.) It was not convenient to make an exact diagnosis at that time, but, whether from uterine disturbance or general asthenia, it seemed clear that the dyspepsia was due to a want of nervous tone in the stomach, and, accordingly, small doses of the wine were prescribed. The relief was prompt and complete while the medicine was used. Her appetite improved and she retained her food, but her general health was not completely reëstablished; nor can I speak positively as to the dyspepsia after she passed beyond my observation a few months later, although I believe that it is ameliorated.

CASE LVI.—I have been informed by a gentleman of intelligence practising in Georgia, of a case of obstinate dyspepsia, that, resisting all ordinary treatment, was finally cured by the persistent use of daily emetics of ipecacuanha extending over several weeks. As the case occurred some years ago and he kept no notes, I cannot give further particulars. The physician was inclined at the time to believe that the repeated shock of the vomiting was the essence of the cure. It seems more probable that the dyspepsia was atonic and was relieved by the stimulus of the medicine.

The following case of excessive vomiting may be considered under this section as an eccentric dyspepsia. It occurred in the practice of Dr. Robert P. Myers, of Savannah, from whose notes it is condensed.

CASE LVII.—14th Dec., 1875, Dr. Myers saw H. B., a large and muscular negro, æt. 38, who was then, as he had been "for some time," vomiting bile. He had a high pulse, some fever, violent pains in the stomach and incessant retching. His bowels were regular and his tongue was clean. Ordered a scruple of ipecac. with warm water sufficient to secure vomiting. Afterward lime-water and milk: then, *R.* Quin. sulph. $\mathfrak{zss}$., Pot. brom., $\mathfrak{ziv}$. aq. f. $\mathfrak{ziv}$., Acid. sulph. ar., q. s.; A tablespoonful every two or three hours.

15th, 9:30 A.M.—The medicine was retained, but he is still vomiting bile with much gastric pain. Used other anti-emetic remedies in connec-

tion with lime-water and milk, ice, and mustard over whole abdomen. Could retain no medicine.

16th, 9:30 A.M.—Still vomiting. Following suggestions of Dr. Woodhull as to the action of ipecacuanha, ordered vini ipecac. $\mathfrak{m}.$ xlviij., aq. f. $\mathfrak{z}$ ij; a teaspoonful every two hours.

17th.—Found the patient up and dressed. All vomiting had ceased after the second dose, and had not returned. Had eaten his breakfast and felt very well except a little weak.

Upon inquiry it appeared that he had been subject to such attacks every two or three years. They generally lasted a week and had been wholly irresponsive to medicine. This might seem an accidental coincidence did not a whole series of vomitings in pregnancy show that equally severe sickness, although from other causes, would yield to such treatment. A natural empirical step would be to use the wine in sea-sickness.

This veterinary, or, more strictly, canine, case whose pathology is hardly well enough made out to warrant incorporation in the series, is, nevertheless, sufficiently interesting to repay perusal.

In the spring of 1875, Hospital Steward Philip Newshafer, U. S. A., then on duty at McPherson Barracks, took charge of a pointer dog that had been driven in a disabled state from one of the company quarters. There was an excessively tender spot at a depression in the dog's spine, where, apparently, some heartless wretch had struck it a heavy blow. The animal stood with difficulty, waking or sleeping its whole body was convulsively agitated as with severe singultus, it was in evident pain, its hide was rough, it was greatly emaciated, dispirited and without appetite, and, when the Steward first befriended it, was so weak that he was obliged to carry it in his arms up and down stairs. He tenderly cared for it and provided food and comfortable shelter, and used such remedies as he thought might be of service; but, except that it was manifestly more comfortable, its health was no better. Sharing my interest in the therapeutical influence of ipecacuanha he tried it, without suggestion from me, upon the dog, giving one grain four times a day. The animal very soon began to improve, became able to walk about, its appetite returned, it grew sleek and fat, the convulsive movements diminished, and, in the course of four or five months, it was nearly, but not quite, well; the spinal tenderness being manifest on pressure. I am personally cognizant of these facts, which I think have an intrinsic interest and may fairly be introduced as linking the dyspepsias and nervous coughs and hiccoughs.

X. Vomiting of Pregnancy and of Other Nervous Conditions.

The control that ipecacuanha possesses over the nausea and vomiting of pregnancy is well attested; but as it is not yet a general practice and is one that seems quite incompatible with the commonly-received theory of its action, a few illustrative cases are introduced.

CASE LVIII.—Mrs. —, an officer's wife, who had borne one child and had suffered two miscarriages, again conceived. In her previous pregnancies the nausea was constant and distressing, causing vomiting after every meal and often at the mere odor of food, as well as debarring her from much of her ordinary exercise. On this account she looked forward with dread to the course of gestation and was incredulous of relief by the means proposed. She took, however, one drop of the wine of ipecacuanha every hour, as directed, and the sickness was completely controlled by a few doses. After the nausea was well checked occasional doses were sufficient, but when they were entirely suspended the sickness returned. By graduating the remedy at her own discretion, she passed through her time without serious annoyance.

CASE LIX.—Mrs. —, an officer's wife, had borne two children and had had one miscarriage. During each of these pregnancies her sickness was intense and was very distressing. In the last one, although not under my care, she was within my observation, and I know that she was confined to her bed for many weeks. Odors of all kinds and even light often caused nausea, and no medication that was tried enabled her to retain her food or even to move about. Upon the occasion of this, her fourth, pregnancy she was given one or two drops of the wine every hour or two, and although she had some nausea it was nothing compared with her former sufferings, and not more than many women habitually endure without complaint.

CASE LX.—Mrs. —, a young lady in her first pregnancy, who resided in the vicinity of New York, I was asked to prescribe for by letter. She was represented as having been sick for some time to such a degree as to be incapacitated for the ordinary enjoyment of life. I advised her to take one or two drops of the wine of ipecacuanha every hour or two, gradually increasing the intervals as she grew better. When she began the treatment she was in bed, unable to raise her head; the next day she was about the house, sick only at times; and the third day she went to New York, shopping. She was able to keep the nausea under control afterward by occasional doses.

The following cases, although not of vomiting of pregnancy, clearly belong to this class, and are of especial interest as linking those cases of nausea with certain obscure dyspepsias.

CASE LXI.—Mrs. —, the mother of two children, whose general health appeared good, asked my advice, in the fall of 1874, concerning some annoying dyspeptic symptoms. She referred all her troubles to the stomach, having frequent nausea, occasional vomiting and much heart-burn. She certainly was not pregnant, but although she was unconscious of any disease of the uterus, I suspected that organ as the

cause of the mischief. She was given the wine as for the vomiting of pregnancy, and the dyspepsia was promptly relieved. Subsequent examination revealed some anteversion with much chronic metritis and enlargement of that organ. This lady died at another station some months later of an independent acute disease, relieved but not cured of her uterine complaint, but with the gastric symptoms controlled by the medicine.

CASE LXII., in the practice of Dr. J. C. Le Hardy, of Savannah.—F. L., æt. 21, prostitute, 23d Dec., 1875, under treatment for anteversion attended with endometritis and endo-cervical ulceration. Suffers with almost constant sickness at the stomach, with occasional vomiting. R. Pulv. ipecac. gr. ix., in nine pills. Three a day.

28th Dec.—Reports that the sickness at the stomach entirely disappeared from the first day and that her appetite has very much improved.

Dr. C. D. Phillips¹ writing of the wine, remarks: "Its beneficial operation is clearly discernible in most cases of continued and obstinate retching or vomiting, where the stomach is not primarily affected, but disturbed by sympathy with some other part or organ of the body, whether the primary affection be acute or chronic." This extract from a paper by Mr. C. C. Fuller² is perfectly in point and is sufficient. He says: "Having given extended trials of the following remedies in this disease [vomiting of pregnancy]—viz., hydrocyanic acid, nitrate of potash, oxalate of cerium, opium, nitro-muriatic acid, bismuth, alkalies and quinine; and though each of these remedies was frequently useful I am convinced that they are all far inferior to ipecacuanha. Its effects are frequently conspicuous in the most severe cases; and it is able not only to control the vomiting which occurs on rising in the morning, but also the more severe forms in which the nausea, retching and vomiting are almost incessant." He then gives the particulars of two severe cases that were promptly controlled by the drop dose, and adds: "I could easily refer to other cases equally successful, but these will serve as examples of the efficacy of this treatment. A more extended experience has proved that a dose administered every four hours is sufficient to secure the same satisfactory results." In this connection attention is invited to Cases LV., LVII.

It is better not to dilute the wine before use, for after the addition of water it is liable to become sour.

¹ *Am. Jour. Med. Sci.*, Jan., 1870, p. 237; fr. *Practitioner*,* Nov., 1869.

² *Braithwaite's Retros.*, lxi., July, 1870, p. 231; fr. *Lancet*,* Dec. 4th, 1869, p. 768, and *Am. reprint*, Mar., 1870, p. 152.

XI. Nervous and Other Coughs and Asthma.

These are treated of together chiefly because there is an obvious feature common to them all as well as, in a measure, to the subjects of the last two sections—the nervous element.

The single faculty that common consent bestows upon ipecacuanha is that of increasing the secretion of the bronchial mucous membrane. But passing over its ordinary expectorant influence, there is unimpeachable evidence of its usefulness in the group now under discussion. The following is only some of that that is comparatively new, for the standard works are full of such cases. Dr. C. D. Phillips¹ says: "It is a most useful remedy in spasmodic coughs attended with profuse mucous expectoration and vomiting, especially in those troublesome coughs accompanied by vomiting which are incident to pregnancy." He states that he has before him twenty-three carefully recorded cases of whooping-cough: "In most of these the cough came on in paroxysms * * and increased in intensity until the contents of the stomach were evacuated. In all these cases, where the vomiting had been more marked than the whoop, ipecacuanha has given very marked relief." He recommends half a drachm of the wine in four ounces of water, of which a dessertspoonful may be taken from one to three hours apart. "In the capillary bronchitis of children, even when complicated with croupy symptoms, it acts well" in doses of a teaspoonful of this mixture every hour or two. In the so-called winter cough of the English Dr. Ringer² has used the inhalation of the atomized wine with wonderful results, all but one patient being benefited. He details some of the more striking cases and reports³ that the dyspnœa is the first symptom relieved. In bronchial asthma⁴ the ipecacuanha spray gave very satisfactory results, but in one case it aggravated the symptoms. The series as originally reported in the *Practitioner* may be studied with advantage.⁵ Pereira's abridged *Manual*⁶ says: "In asthma, benefit is obtained by it not only where given so as to occasion nausea and vomiting * * but also in small and repeated doses."

¹ *Loc. cit.*

² *Handbook of Therapeutics*, 4th ed., New York, 1875, p. 399.

³ p. 401.

⁴ p. 403.

⁵ See also *Lancet*,* Sept. 5th, 1874, p. 338, and *Braithwaite's Retros.*, Jan., 1875, p. 101.

⁶ *Op. cit.*, p. 613.

Phillips¹ writes: "In many cases of nocturnal spasmodic asthma, in which hours are spent in great distress, with livid face and lips, loud wheezing throughout the chest and want of breath, causing fear of suffocation, if there is no organic disease of the heart or lungs, [that is, if it is a nervous derangement,] ipecacuanha will give quick and marked relief." The dose is five drops of the wine every ten or thirty minutes, diminishing its size and frequency as relieved. "Care should always be taken to avoid its emetic or nauseant effect. In these affections of the lungs its expectorant and anti-spasmodic character cannot well be doubted, nor its curative action in controlling and stopping the abnormal secretion of mucus." Ringer² says: "Dr. Hyde Salter strongly recommends ipecacuanha in hay asthma, employing it to cut short a paroxysm of dyspnœa." "He gives it in doses * * too small to excite vomiting." In this connection Dr. Salter's paper in Reynolds' *System*³ may be profitably consulted. While Ringer⁴ asserts that the use of ipecacuanha is "directed only against each attack" and "leaves the complaint in other respects untouched," which is the natural teaching founded on the modern notions of its power, Akenside⁵ found it specially useful in asthma of hysterical origin, not simply relieving a particular paroxysm but, in non-emetic doses continued for several weeks, frequently affecting a cure of the condition.

As this affection is notoriously regarded as a type of those requiring depression, so will it at once be cited to prove the falsity of the doctrine I am attempting to establish. It would interfere too greatly with the continuity of this paper to discuss here the pathology of asthma and the mode of its relief. Later, however, an effort will be made to reconcile the common practice and this hypothesis. Meantime the reader is requested to suspend his judgment upon the *modus methendi* until after argument.

But influenced by the views that underlie this paper, I was led into the following experiment.

CASE LXIII.—I persuaded an elderly gentleman, formerly an officer of the army, who had suffered from asthma from childhood, and had resorted to almost every treatment at home and abroad, to use the wine in

¹ *Loc. cit.*

² *Op. cit.*, p. 405.

³ *iii.*, pp. 512-536.

⁴ *Op. cit.*, p. 405.

⁵ *Trans. Lond. Col. Phys.*,* i., p. 93.

drop doses experimentally. After five weeks' trial he kindly wrote out his experience, from which I abstract the following. He knows of no hereditary predisposition, and the first attack, fifty years ago, when he was eight years old, was attributed to a cold, caught on the sea-beach, which culminated in a severe illness of three weeks. During youth and early manhood he suffered frequently and intensely. The exciting causes have been and are gastric disorder, catarrhs, the odor of paint and of certain aromatic flowers, and the irritation of dust. The paroxysm frequently occurs in one particular house, or in one particular room in a house, and nowhere else in the vicinity, and its coming on is frequently traceable to no apparent cause. Retiring perfectly well, in twenty or thirty minutes he would be gasping for fresh air at an open window. He has exhausted treatment in the use of all the ordinary drugs, moxas and other counter-irritants, a galvanic necklace, and all the devices and methods known to American, English and French physicians. Nothing has proved of permanent value. Some of these means have relieved for a time, and some not at all. He never had an attack in camp or bivouac, however exposed to wet, cold or heat. During the Mexican war neither he nor several severely asthmatic officers, with whom he frequently compared notes, had an attack after leaving the *tierra caliente* and ascending the higher regions, until their return to Vera Cruz, at the closing of the war. This they attributed to the rarity of the atmosphere, due to its elevation above the sea. In 1857, being in camp for six months on the Verde, in Texas, he enjoyed perfect freedom from the asthma and began to gain flesh. His weight has increased from 105 pounds at that time to 163 pounds at present, and as he grew stout "the frequency of the attacks and their violence decreased, resolving into an oppressive phthisic, experiencing real asthma only when excited by paint, dust or other active cause." (His ordinary breathing resembles that of emphysema, but I have made no physical examination.)

As he had for some time abandoned treatment, but being still subject to attacks from direct irritation, I induced him to attempt the continuous use of the wine, of whose influence he was quite incredulous, in the hope that a constitutional effect might be obtained that would lessen his susceptibility to the exciting causes. The following is an extract from his note: "You saw me, I think, in one slight attack from dust, and at your request, for experiment, I tried your proposed remedial agent; beginning the next morning before breakfast, and taking it as prescribed before each meal and before going to bed—4 drops a day. The effect of the dose was marked in its sensations upon the brain and stomach, but not unpleasantly so. After two days' allowance for fancies or imaginations in connection with them, I noted actual results. One day recollecting after dinner that I had not taken the drop before it, I took it, and the action in relieving a sense of fulness after a hearty meal was so prompt and decided, that I changed the time of taking the remedy to after meals instead of before, and with unmistakably better effects. It is now five weeks since you prescribed it, in which time I have had but two attacks of 'phthisic' from dusty streets, and have enjoyed a free breathing apparatus. How long it may prove a remedy is yet to be seen. My impression is favorable to its good influence, but mine is so old and tough a case that you had better, if you can, try it on some younger patient, whose attacks are real asthma such as I had at first."

This gentleman adds: "Its use has suggested to me the idea that it would be effective in sea-sickness, which I suggest from many and long experiences."

This case is about as unfavorable as could well be selected, while the results, up to the date of printing, are very satisfactory. But it is published as a suggestion, not as a proof.

XII. Drunkenness and Delirium Tremens.

Perhaps the admitted uncertainty of the emetic action of ipecacuanha is most frequently exemplified in cases of drunkenness, where it is commonly prescribed to disgorge the stomach. When that organ happens not to be full, draughts of water are generally necessary to obtain vomiting; and, as the medicine is suspended after vomiting has been secured, its other effects are not often recognized. I think, however, that many physicians, when their attention is called to it, will remember cases where no vomiting has followed, but where sleep has ensued from which the patient has awakened sober. This sleep is usually regarded as the direct effect of the intoxication, but it is probable that the medicine accelerates it and has a material sobering influence. The two succeeding cases show how it may be useful in ordinary drunkenness.

CASE LXIV.—Acting Asst. Surg. Pierson Rector informs me that in the spring of 1875, at Yorkville, S. C., he gave a soldier, who was furiously drunk and under charge of the guard, forty grains of ipecacuanha in four ounces of water. He went to sleep at once, perspired freely, slept three hours and awoke perfectly sober. He was then a little nervous but required no further treatment.

CASE LXV.—J. M. was admitted hospital, Atlanta, 26th August, 1875, in the nervous condition consequent upon several days' drinking. He was put to bed and given at 7 A.M. ipecac. gr. xx. without opium or mustard. In an hour he vomited a little, but was much easier. At 11 A.M. given ipecac. gr. xv., tr. opii $\mathfrak{m}$.x. He did not vomit, and slept soundly into the afternoon. Upon waking he complained of headache, and at bedtime was given potas. bromid. gr. xx. 27th.—Duty.

I am quite willing, however, to admit that my experience does not warrant recommending ipecacuanha as other than an evacuant remedy in those cases of simple inebriation that are apt to come under professional notice.

But the most valuable evidence of its efficiency in disease from alcoholism is supplied by Dr. W. L. Schenck,¹ from whose article on delirium tremens the following is condensed.

¹ *N. Y. Med. Jour.*, Oct., 1872, xviii., 4, p. 413.

CASE LXVI.—After saying that for many years he has been in the habit of giving full doses of ipecacuanha, he presents this as a typical case.

Jan. 2d, 1865. Found the patient wildly delirious with a tendency to violence. Gave him twenty grains of powdered ipecacuanha every fifteen minutes, until two drachms had been taken. No emesis was produced, but the delirium was almost wholly relieved. On becoming conscious and finding an emetic had been given, he insisted upon drinking half a pint of warm brine and upon tickling the fauces with a feather to assist its operation. After his stomach was emptied he slept the remainder of the night and had but a slight return of the delirium.

The doctor has since given this man the ipecacuanha treatment for the same disease with equal success; and his wife afterward wrote for the prescription, complaining that other treatment did not relieve him.

In a private letter dated 7th July, 1875, Dr. Schenck writes me that he "did not look upon emesis as essential to the cure, but allowed him his way. He soon went to sleep, awoke free from delirium, and made a good and speedy recovery." In the second attack, which was promptly relieved by the ipecacuanha, there was no vomiting. Dr. Schenck also furnished me the notes from which the following is compiled.

CASE LXVII.—J. P. T. was exceedingly nervous, complaining of feeling strangely, and soon became delirious and haunted by frightful visions. The case looked like mania a potu, although he was not known to be a drunkard, and he was given thirty-grain doses of ipecacuanha every ten or fifteen minutes. After a few doses he became calm and had no return of the delirium. It afterward proved that this man was a regular drinker, though never to drunkenness.

Dr. Schenck adds: "Thus far I have never failed to relieve this horrible condition with ipecac., but lost two patients before I commenced its use."

In a still later letter he informs me of this case in which he used large doses of ipecacuanha, but, as he thinks, with doubtful effect, though after them the patient became calm.

CASE LXVIII.—P. T. was seen in the evening of 9th October, 1875, delirious and shaking as with a terrible ague. Gave him full doses of ipecacuanha and elixir of the valerianate of ammonia, with sinapisms to the spine. In a few hours he became quiet but did not sleep. The next day he was calm but sleepless. In the evening found him lying with the eyes widely open but noticing nothing, not even when spoken to, and breathing stertorously and with difficulty. Prescribed fifteen grains of chloral, which, repeated in an hour, secured a quiet sleep, from which he awoke in the morning calm and refreshed and made a rapid recovery without other treatment. Dr. Schenck remarks: "What part ipecac. had in the play is doubtful. I think the quiet and perfect recovery due to it, though largely aided by the elixir and chloral."

XIII. Opium Poisoning.

Stillé¹ says: "Some writers of the Italian school advocate the use of this substance as a counter-poison to opium, which they look upon solely as a stimulant, and they cite cases in which without producing any evacuation it dissipated the phenomena of narcotism. If the facts are authentic the explanation is unsatisfactory."

I know of no cases nor of any confirmation, original or at second hand, on this point. It will be briefly noticed later, but the interest in it at present is theoretical rather than practical.

XIV. Neuralgia.

This form of disease is not as frequently seen in military as in some branches of civil practice. But the following cases, although few, have a value.

CASE LXIX.—Captain K., who has suffered much from malarial infection, is subject to violent cranial neuralgia, for which quinine, which he habitually keeps in his house and takes at discretion, has been the usual and most satisfactory remedy. Having had severe and almost constant neuralgia for several days, he took nine grains of quinine night and morning for two successive days without producing any impression. He applied for treatment 19th April, 1875, when I suspended the quinine and supplied him with one-grain pills of ipecacuanha, one to be taken every four hours. After the fifth pill the pain ceased. He then increased the intervals and the pain recurred the following night, (3 A.M., 21st,) but stopped after the third pill at the former interval. On the day after (22d,) maxillary neuralgia set in, but ceased after the second dose. He continued the medicine until nausea occurred that night, after which he took it only twice a day. During the two following months that Captain K. remained at the post of Atlanta he was well.

The preceding case has a direct relation to those reported under Section XV.

CASE LXX.—I regret not taking notes at the time in this case, but, as I remember it some weeks after its occurrence, the facts are these.

Lieut. W., at Atlanta, suffered a severe pain in the inferior maxilla, not due, as far as recognizable, to any local cause. He was given ipecacuanha in small doses, and while taking it the pain passed away and did not return.

Neuralgias are, however, so eccentric in their course, that I feel indisposed to lay stress on this instance or on the memorandum succeeding.

¹ 3d ed., ii., p. 391.

My friend Dr. A. W. Calhoun, of Atlanta, informed me of one case in a young woman where an obstinate and severe supra-orbital neuralgia, that had resisted a variety of treatment, disappeared under the use of small doses of ipecacuanha, the patient being ignorant of the name of the medicine. It failed on a recurrence of the complaint a fortnight later, the name meantime having been revealed.

Neuralgia is one of the affections in which Mr. Higginbottom¹ regards ipecacuanha useful; but I know of no case that he has published. I believe that it will be chiefly valuable in the idiopathic form.

XV. Intermittent Fever.

It was formerly an English, and it is at this time a common Italian, practice to administer an emetic of ipecacuanha in beginning to treat an intermittent. The French think it is useful only by relieving the gastric embarrassment; but as Polichronie,² who regards it of sufficient interest to merit renewed research, remarks, many claim that it has a febrifuge action analogous to that of quinine. Udhoi Chand Dutt,³ a civil medical officer in India, reports the cure of seventy-four out of seventy-six cases of intermittent, in from three to five days, by the administration of minute doses of ipecacuanha. Encouraged by this example, especially as it appeared in consonance with views to be explained later, I made a series of experiments in this disease, a number of which follow.

Bearing in mind the tendency of soldiers to avoid duty by feigning the lighter forms of sickness, especially chills, only those cases have been taken account of that I have personally watched or that were observed by reliable third parties, and whatever rests on the statement of the men themselves is so noted. Most of the earlier cases were drawn from a detachment that was stationed in a highly malarious region in Alabama from the middle of September until the latter part of November, 1874, where nearly all of the command suffered severely from that influence. Atlanta, whither they returned late in November, is high and breezy in location, with granitic subsoil, where the paroxysmal fevers rarely originate. I am assured, however, by promi-

¹ *Brit. Med. Jour.*, Aug. 25th, 1868; *Ranking's Abst.*, xlviii., p. 92.

² *Op. cit.*, p. 24.

³ *Phila. Med. Times*, ii., p. 416, fr. *Indian Med. Gaz.*,* June, 1872.

nent resident physicians that imported cases are exceedingly obstinate and show little or no tendency to spontaneous cure. My own experience agrees with this. Very few of the cases were continued ague that might be supposed to have yielded to climatic influences, but the most, and especially the severer ones, were attacks that recurred after temporary suspension by quinine. The temperature in these cases, as in all of mine where not otherwise noted, was taken under the tongue.

CASE LXXI.—J. S. reached Atlanta, from Alabama, 25th November, 1874. He was seriously ill in Alabama for nearly two months with a fever that finally took the form of tertian intermittent, which had lasted three weeks. One of these chills occurred on 27th, and he was taken in hospital in order to try ipecacuanha in this affection.

28th.—R. Pulv. ipecac. gr. j. ter die. Temperature: 10 A.M., 101°; 3 P.M., 100.4°; 6 P.M., 100.8°. Notwithstanding this excess, he was not conscious of it through his sensations.

29th.—This was the day for the chill, and about the hour it was due there were some indications of it, but there was no rigor and no fever. Temp.: A.M., 99.4°; P.M., 100.4°.

This treatment, namely, one grain of ipecacuanha three times a day, was continued while he was on sick report, and the following are the thermometrical notes: 30th, A.M., 98.8°; P.M., 98.6°: 1st Dec., A.M., 97.8°; P.M., 98.6°: 2d, A.M., 98.8°; P.M., 98.2°: 3d, A.M., 98°. Duty.

There was a little nausea after the first dose on the first day only. No appearance of chill occurred after 29th. The medicine was continued for two weeks after his return to duty. Did this case stand alone, the change of locality would throw doubt on the influence of the drug.

CASE LXXII.—C. S. E. returned to Atlanta from Alabama on the night of 30th November, 1874. The medical officer with that detachment rendered this history of him: Seven or eight weeks ago he was attacked with well-marked tertian intermittent, for which he took sixteen grains of quinine. The chills then stopped and for a week he took pills, each containing two grains of quinine, two of subcarbonate of iron and one-thirtieth of a grain of arsenic. He ceased taking these, contrary to orders, and the ague returned in a few days. Sixteen grains of quinine again suppressed it, and he continued taking the pill above described until 25th November, when he had a well-marked chill. On 26th, he took twenty-four grains of quinine, and, the company marching, he received no more medicine.

5th December.—Reported at sick call, asserting that he had had a severe chill, lasting two hours, at three o'clock the previous afternoon, followed by a fever for several hours. Admitted hospital at once and given one grain of ipecacuanha every six hours. Temperature: 7:30 A.M., 97.6°; 2:30 P.M., 97.8°; 4 P.M., 102.2°; 8:30 P.M., 101.8°. This was not the chill day, but he had a light chill from 4 to 4:30 P.M., although he did not recognize any fever.

6th.—To take one grain every four hours. Temp.: 7 A.M., 98°; 1 P.M., 98°; felt well until 4 P.M. when a light chill, lasting between thirty and forty minutes, occurred. Temperature during the chill, 98.4° (this was carefully observed); at the beginning of the fever, 103.4°; 6 P.M., 104.2°; 8 P.M., 103.2°.

7th.—Temp.: 7 A.M., 97.4°; 3 P.M., 98°; 6 P.M., 98.2°. One grain every four hours continued without nausea.

8th.—Temp.: 7 A.M., 97.2°; 4:30 P.M., 99.2°; 6 P.M., 98.8°. Although this was the regular day for the chill, he had no abnormal sensation, the thermometer alone indicating a derangement. He took two grains every three hours this day.

9th.—Treatment continued. Temp.: A.M., 98.4°; P.M., 99.4°.

10th.—Treatment continued. A careful thermometrical watch was kept for the chill, but there was no indication of it, and he said that he felt better than he had for a long time. Temp.: 7 A.M., 97°; 9 A.M., 98°; 1 P.M., 98.4°; 4 P.M., 98.4°; 7 P.M., 99°.

11th.—Duty. To take one grain every six hours for three weeks, and to report any indication of ague.

11th January, 1875.—Reports that he has taken no medicine for a fortnight, that on 9th he had a chill and that he also had one to-day. He has been exposed daily for some time to cold and wet as a quartermaster's laborer. Directed to take two grains of ipecacuanha every two hours and to report promptly if not better. He was also relieved from extra-duty as a laborer and was returned to ordinary military duty. There was no further trouble with this case, which was regarded by the officer first treating it as peculiarly obstinate and as well suited to test the anti-periodic powers of the drug.

CASE LXXIII.—Lieut. W. This officer has recently spent two months at Butler, Ala., where he was obliged to take prophylactic doses of quinine daily. After his return to Atlanta he had irregular symptoms of ague, culminating on 8th December, 1875, in a mild chill, which recurred with some febrile reaction on the ninth. For several years past, following severe malarial intoxication in Texas, he has been liable to such disturbances on comparatively slight provocation; but his chills are of the so-called dumb variety, being never well marked by rigors. His bowels are sluggish. Temp.: 4 P.M., 99°. R. Pil. cath. c., no. iij., at once: ipecac., gr. j., every three hours.

10th.—Bowels moved freely but not excessively. The ipecacuanha induced disagreeable nausea but no vomiting; the skin became moist and he felt better, although there was some chilliness and febrile disturbance at the usual time, a little after noon. Temp.: 4 P.M., 99°. Continue the ipecacuanha.

11th.—Less nausea; skin moist; not chilly, but is disinclined to move much in the open air; bowels loose, but not purging; temperature not noted. After to-day to take one grain every six hours.

12th.—Not so well as yesterday; more chilly, but not regularly aguish; better in the afternoon; temp.: 4 P.M., 100°. To take one grain every three hours and two grains at 12 M. to-morrow.

13th.—Much better; no chilliness.

This treatment was kept up for several weeks, with gradually increased intervals between the doses. He continued to improve steadily, so that, although at no time off duty from sickness, his better health was plainly observed and commented upon by himself and others.

CASE LXXIV.—Special attention is invited to the earlier part of this case as illustrating the association between intermittent and dysenteric diseases, and the influence of ipecacuanha on both. A. J. S. gives the following history, which is corroborated by his officers. He was well for the first ten days of his duty in Alabama. Then, being on the road for three days and nights continuously, as a teamster, was immediately thereafter seized with "swamp fever," with which he was ill several weeks. He then did duty for a week, when he had tertian intermittent for two weeks. After a fortnight's intermission the chills recurred, during which attack his company returned to Atlanta. He had one chill on the road, but none after reaching the post, 28th November, 1874, until the attack here noted. On 12th and 13th December felt weak and unwell; on 14th had a light chill at 2 P.M., the fever lasting till 9 P.M.; on 15th had a more severe chill which, with the fever, lasted from ten to three o'clock; 16th, no chill.

17th December.—Up to this date he had discharged his duty (as teamster) and did not apply for medical assistance. Felt badly early in the morning, and about nine o'clock a painless, copious diarrhoea set in, for which he took a drink of hot whiskey. There were five thin, black stools, which he compared to liquid pitch, between nine and one o'clock. A violent ague attacked him at 10 A.M., when he was obliged to quit work and lie down in his quarters. During this chill he had great nausea and vomited violently four times, the first part of each ejection being thin and watery and the latter intensely green and bitter and thrown up with straining. There was also much abdominal pain between eleven and three o'clock. Admitted hospital 2 P.M. Temp.: 102.2°. R. Ipecac. gr. j. at 2 and 4 P.M. No nausea, but in the course of the afternoon he had five stools, small thin, reddish throughout as from blood, with minute yellow specks through them. There was no pain with these, but they were very offensive in odor. 6 P.M.—Feels weak and prostrated, but free from pain. Temp.: 99.8°. R. Ipecac. gr. x., opii gr. ss., at once and very early in the morning.

18th.—Slept well all night. The second dose was taken at 4 A.M., and no nausea followed either. Temp.: 97.6°. Arose after eating breakfast. Bowels not moved. Took ipecac. gr. v., opii gr. $\frac{1}{4}$, at 2 P.M. Slightly chilly, with feverish reaction and moderate perspiration. Temp.: 6 P.M., 103.8°. Repeat the dose at 9 P.M. and 4 A.M.

19th.—Temp.: 7 A.M., 97.8°. Feels well and slept well all night. To have breakfast at 10 A.M. and a pill at 12 M. Temp.: 1 P.M., 98°. Dinner at 3 P.M. Temp.: 6 P.M., 98°; another pill. The bowels not having moved since the first large dose of ipecacuanha, to take Rochelle salts at 8:30 P.M.

20th.—Bowels moved painlessly four times in the night, the first three motions being thin and yellow and the last natural in color and consistence. Temp.: 7 A.M., 98.4°; 1 P.M., 98°; 6 P.M., 98°. A five-grain pill at ten and two o'clock.

21st.—Temp.: 7 A.M., 98.1°; 1 P.M., 98.2°; 6 P.M., 98.8°. To take ipecac. gr. j. every two hours, beginning at 9 A.M.

22d.—Temp.: A.M., 98°. Returned to quarters and to take a two-grain pill every two hours.

23d.—Duty. To take one or two one-grain pills four or five times a day and to report the first indication of a chill.

It will be noticed that this man had no sensation of ague after 18th, the day after he was attacked, and that his temperature also was prac-

tically normal from 19th. He was simply retained for observation after that date. On the evening of the day he was returned to duty (23d) he missed parade, and consequently was confined in the guard-house.

26th.—Came to sick-call as a prisoner, claiming to have had a chill yesterday. As he began to drink as soon as he was relieved from hospital, it is probable that he did not take his pills regularly, if at all, and that he had the chill as stated. Temp.: 10 A.M., 98.4°. Remanded to the guard-house and directed to take two grains every two hours.

27th.—Temp.: A.M., 99.4°. Says that he took five doses yesterday, but that he had a chill and a high fever at night. Admitted hospital and given ipecac. gr. ij., every two hours. A light chill in the afternoon. Temp.: P.M., 101.4°.

28th.—Temp.: A.M., 98.6°; 2 P.M., 99°; P.M., 103.8°. A still lighter chill this evening. Treatment continued, and at 10 P.M., ipecac. gr. v., opii gr. $\frac{1}{4}$.

29th.—Temp.: A.M., 101.4°; P.M., 99.8°. Two grains every two hours. No chill.

30th.—Temp.: A.M., 97.2°; P.M., 98.6°. 31st.—A.M., 97.6°; P.M., 99.2°. Treatment continued and no chill.

1st January, 1875.—Temp.: A.M., 96.6°; P.M., 101.4°. Notwithstanding this fluctuation, he has no disagreeable sensation.

2d.—Temp.: A.M., 99.8°; P.M., 101°. Treatment continued. No chill.

3d.—Temp.: A.M., 99°. Duty. To take one grain every three hours for three weeks.

It will be observed that this relapse occurred just one week after the first attack ceased, probably induced by careless exposure. The paroxysms became lighter to his sensations immediately after resuming the treatment, and, curiously, the very marked subsequent fluctuations were not noticed by the patient.

19th January.—Again reports sick. Claims to have taken the one-grain pills regularly to include yesterday. Says he felt chilly on the afternoon of 16th; on 17th had no chill but a high fever; on 18th a sharp chill at 1:30 P.M., with a fever lasting all the afternoon. Admitted hospital. Temperature to-day: A.M., 97.8°; 11:30, 97.2°; 1 P.M., 97°; 2:30, 96.8°; 6, 98.8°. Took ipecac. gr. xx., tr. opii $\mathfrak{m}$.xx., at 11:30 A.M. and soon fell asleep. There was no vomiting nor uneasiness, and at 8:30 P.M. took ipecac. gr. v., opii gr. $\frac{1}{4}$.

20th.—Took the same pill at 4 and 9 A.M., and 1 P.M. Temp.: 7 A.M., 98.2°; 1 P.M., 98.8°.

21st.—Temp.: A.M., 97.8°; P.M., 98.2°. Repeated pill at nine, one, and half-past six o'clock. Slept well all night and felt well all day.

22d.—Temp.: A.M., 97.8°; P.M., 98.4°. Same dose at 1 and 6 P.M.

23d.—Temp.: A.M., 97.8°. Duty. To take two grains every two hours regularly.

During this exacerbation he had no chill while actually under observation, but from the range of temperature on 19th it is likely that he had the chill, as he asserts, three weeks after the last one in his

previous attack. During the four days that he was in hospital he took sixty-five grains of ipecacuanha without nausea.

26th January.—Reports having had a chill with high fever last night, that is, one week after the last chill. Is on extra-duty as striker in the blacksmith's shop: that is, is at hard labor under marked changes of temperature. Temp.: A.M., 102.6°; P.M., 101.4°. Two-grain doses resumed.

27th.—Temp.: A.M., 97.2°; P.M., 101.4°. Had no chill, but toward evening felt warm and went to bed. R. Ipecac. gr. v., opii gr. $\frac{1}{4}$, at 9 A.M. and 1 P.M., and ipecac. gr. x. (without opium) at 6 P.M. There was no emesis.

28th.—Temp.: A.M., 99.6°; P.M., 98.3°. Ipecac. gr. iij. every three hours.

29th.—Temp.: A.M., 97.6°; P.M., 101°. Treatment continued.

30th.—Temp.: A.M., 98.6°; P.M., 98.6°. R. Ipecac. gr. x., op. gr. ss., 6 A.M., and three grains every three hours through the day.

1st February.—Temp.: A.M., 98°. Duty. Relieved from extra-duty and returned to his company. Directed to take small quantities of ipecacuanha regularly and at short intervals for a long time. There was no further relapse.

In brief, this case is that of a careless man of irregular habits, who was well poisoned by malaria a few months previously, in whom there were four distinct outbreaks, each of which promptly subsided under ipecacuanha given experimentally in various quantities. There was a dysenteric tendency at the very outset which yielded immediately.

The next case illustrates the association of this tendency with intermittents and the prompt subsidence of both under ipecacuanha.

CASE LXXV.—J. B. was on several occasions sick with some malarial fever while in Alabama in the autumn, but after returning to Atlanta he remained well until the latter part of January, 1875, when symptoms of ague came on, culminating in a chill, 3d February. A second and violent chill occurred before daylight on the 4th. The junior medical officer then gave him hydrg. chl. mit., jalap, aa. gr. x.

5th.—A more severe chill accompanied by excessive vomiting and followed by exhausting perspiration occurred before daylight. Temp.: 9 A.M., 96°; 11 A.M., 97.2°; 6 P.M., 97.4°. Given two grains ipecacuanha every two hours and, the bowels moving too freely, a dose of Hope's mixture at 6 P.M.

6th.—Had a slight "crawling" sensation but no chill this morning. Feels aguish and not well, but better. The bowels, however, have moved frequently and painfully, and he has much painful irritation in the transverse colon. Being married he is treated in his quarters, where the discharges were not preserved for observation, but the description given was of dysentery. Continued a two-grain pill every two hours, and at 11 A.M. gave ipecac. gr. xv., tr. opii $\mathfrak{m}$.x., in a paste with water. Became a little nauseated but did not vomit. The discharge from the bowels ceased at once and the pain gradually disappeared. Temp.: A.M., 96°; P.M., 99.4°.

7th.—Slept well and had no chill. The bowels moved naturally this

morning. Temp.: A.M., 96.8°; M., 97.6°; 6 P.M., 98.2°. Treatment continued.

There was no return of the disorder nor did the temperature vary materially from the normal. The treatment was continued for some time, and he was retained upon the sick list until 15th, so that his strength, prostrated by the severity of the outset of the disease, might be regained.

CASE LXXVI.—Mrs. —, of good general health, was confined on the morning of 6th January, 1875, having a natural and easy labor. The after-pains were somewhat more sharp and constant than usual, but nothing especial occurred until 10th, when she experienced a slight rigor followed by a perceptible fever and by wandering but severe general pains in all the limbs. There was a little subsequent perspiration. It was not convenient to use the thermometer, but her pulse during the exacerbation reached 109. This lady, on several previous occasions, when her health had become temporarily impaired, had mild attacks of intermittent fever; and I regarded this as similar, and not as milk fever, as it may occur to the reader. In view of Trousseau's praises of this drug in the puerperal state, as well as its presumed action in intermittents, she was ordered ipecac. gr. xx., opii gr. j., in pil. iv.; one to be taken at 8 P.M., 1 A.M., and 6 A.M.

11th.—Was not materially nauseated and slept well. The fourth pill was taken at 10 A.M., after which two grains of ipecacuanha was ordered every two hours. While taking the larger doses she was cautioned about drinking; but not understanding that the same rule applied to the smaller pills, she took one immediately before tea and that meal was rejected. There was no attendant nor subsequent nausea. During the night she took four doses.

12th.—Ipecac. gr. ij. every four hours during the day, and in the night at 10 P.M. and 3 and 6 A.M.

13th.—Medicine repeated at 10:30 A.M., 3:30 and 9 P.M. and 6 A.M.

There was no recurrence of the paroxysm and the patient made a uniform and speedy convalescence. The only emesis was that noted, and although occasional nausea occurred it was not severe.

CASE LXXVII.—Mrs. —, who has spent a number of years in this latitude, has every spring an ill-defined malarial attack, generally culminating in an ague. About the middle of March, 1875, she complained, at Atlanta, of impaired appetite, languor, fugitive pains and headache, developing into a slight but marked chill. She also had occasional feelings of weight and pressure in the abdomen, and some spinal tenderness was found. Quinine, which she had been accustomed to use, has very disagreeable effects. I therefore gave her a one-grain pill of ipecacuanha four times a day. She also was given an ammoniacal liniment as a spinal counter-irritant. The first pill nauseated her but she did not vomit. She had no further annoyance from the medicine until after the entire disappearance of the morbid symptoms, which occurred soon. The nausea then again set in and the ipecacuanha was stopped. In this case the chills ceased at once, the pains subsided, the spinal tenderness disappeared and the appetite, digestion and spirits became natural within a few days.

CASE LXXVIII.—D., an elderly colored woman, complained of almost identical symptoms with the last case, excepting the spinal tenderness. She was given one grain four times a day, and in a few days was completely restored.

CASE LXXIX.—D. H. W., a recruit, admitted hospital, Atlanta, 4 P.M., 14th April, 1875, having just had a heavy chill. Temp.: 4 P.M., 101.6°; 6 P.M., 102.6°. R. Ipecac. gr. j. every three hours.

15th.—Temp.: A.M., 98°; 2 P.M., 98°; 6 P.M., 99.2°. No chill, but much aching in the legs. Treatment continued.

16th.—Temp.: A.M., 98.2°; P.M., 98.6°. As yesterday, but better.

17th.—Temp.: A.M., 96.2°; 3 P.M., 97°; 6 P.M., 97.6°. No chill.

18th.—Temp.: A.M., 95.2°; 10 A.M., 96.6°. Notwithstanding this exceedingly low temperature, which was carefully observed, he had no unusual feelings except the general aching.

20th.—Duty; with directions to continue the treatment, which had been adhered to from the first.

CASE LXXX.—C. P. S. Had a sharp chill 10 A.M., 2d November, 1875, Savannah, Ga. Admitted hospital, very weak and depressed. I learn that this man has had several attacks of malarial disease during the fall. Temperature: 11 A.M., 103°; 5 P.M., 101°. R. Ipecac. gr. x., opii gr. ss., at 9 P.M. Slept well all night and perspired freely.

3d.—Took ipecac gr. x., opii gr. ss., at 6 A.M. Temp.: 6 A.M., 95°; 9 A.M., 97°; 2 P.M., 98°; 5 P.M., 100°. R. Ipecac. gr. j. every two hours.

4th.—Temp.: 8 A.M., 99°; 3 P.M., 103°; 5 P.M., 102°. Felt cool about noon, but had no chill. Was feverish for three hours in the afternoon. Treatment continued.

5th.—Temp.: 7 A.M., 99°; 5 P.M., 100°; 9 P.M., 99°. No bad feelings.

6th.—Temp.: 7 A.M., 98°; 5 P.M., 100°. No chill, but felt badly in the afternoon.

7th.—Temp.: 7 A.M., 98°; 5 P.M., 99°; 9 P.M., 98°. Feeling very well.

8th.—Temp.: 7 A.M., 95° (?). Felt well until noon when he became slightly dizzy. 12:30, 99°; 6:30 P.M., 95° (?). Felt well, afternoon and night.

This man was returned to duty 11th. and instructed to continue taking one pill three times a day. He failed to do this and had a light chill three weeks after the last one. He resumed the grain doses, and no other occurred before he left the post with his company, 4th December.

I repeat the remark that I believe all the cases detailed, as well as those used in making my statistics, are genuine and that the men experienced exactly the symptoms described. They were kept longer than usual on the sick list on account of the fluctuations of temperature shown by the thermometer, although these were not recognized by the patients. In ordinary practice such cases are styled cured as soon as the chills cease, and I do not think that the circumstance of these men being detained from duty for a longer time should militate against the therapeutical record.

I regret that, having become satisfied of the value of the remedy and prescribing it freely, I failed to take exact notes after completing the series of cases first reported to the Surgeon General. I am within bounds in saying that I have used it in at least fifty cases; that in no instance of ordinary uncomplicated ague has it failed; that in about

one-half of the cases no chill happened after beginning to use the medicine, in half the remainder only one chill occurred, and in only one or two were there more than two or three paroxysms that were recognizable—a result that at least equals what might be looked for from quinine in this disease. Without claiming for it an absolute equality with quinine as an antiperiodic, I have not found it necessary to resort to that more costly drug in intermittents since beginning the use of this, nearly eighteen months ago; and within that period I have only prescribed the alkaloid in them at the special request of some officer or lady who was incredulous that any other medicine could be efficacious. Although I have used it experimentally in varying quantities up to twenty grains at a dose, my present impression is that one or two grains, from three to six hours apart, is an efficient practice in ordinary chills.

While distinctly expressing my own opinion of the value of ipecacuanha in intermittent fever, it is but fair to say that several medical friends, who have tried it at my suggestion, do not agree with me, but the particulars of the failures have not been reported. On the other hand I am permitted to use this favorable experience from others.

CASE LXXXI.—Dr. S. S. Beach had a patient at Livingston, Ala., who was “full of miasma” and suffering from tertian chills. Quinine in three-grain doses or more he invariably vomited and he (the patient) insisted that it never did him good. Dr. Beach gave him ten grains of ipecacuanha and five of calomel, in syrup, eight hours before the anticipated chill, and repeated it twice, two hours apart. There was no chill. The third dose caused a peculiar sensation about the salivary glands and a profuse flow of saliva, but there was no vomiting. The attack, which had been obstinate, ceased.

My friend, Dr. V. H. Taliaferro, of Atlanta, writes me that he has treated two cases of intermittent fever (one patient being intolerant of quinine) with small doses of ipecacuanha in the manner I have suggested, with marked success. Neither of the cases having a return of the chills after commencing this remedy. He remarks that he should have some misgivings of its power in this disease in malarial regions.

Dr. Robert P. Myers, of Savannah, informs me that, in the summer and fall of 1861, being then in the Confederate service, he successfully treated at Oglethorpe Barracks, Savannah, many cases of intermittent fever, in soldiers brought up from the works on the Savannah river, with ipecacuanha in ten-grain doses three times a day given non-emetically. Some allowance must be made for the change from the

exposure of the swamps to the comparative healthfulness of the city, but Dr. Myers regarded the agent and the method as well adapted to cure the disease. Unfortunately his notes are lost, and his later service was not suited to carry on the experiment.

XVI. Febrifuge Action.

As noticed in the preceding section, many of the French believe that ipecacuanha has a febrifuge action analogous to that of quinine. That it has a powerful influence over intermittent fevers I think has been conclusively shown, and in that sense its febrifuge action may be admitted. But whether it possesses a direct anti-pyretic power may be a quite different question. As a contribution to its solution I am permitted to use this case, which fell under the observation of a physician of Savannah.

CASE LXXXII.—Charles —, æt. 10 years, colored. This child is reported, 27th Jan., 1876, having had fever for ten days. Present appearance: tongue heavily coated with a yellowish fur; intense pain in the head; wandering delirium; abdomen tympanitic; no diarrhœa; no tenderness on pressure, except over epigastrium; temperature not noted, but the skin is very hot; pulse 168 per minute. Directed hot applications to the epigastrium and ten grains of ipecacuanha in sugar every hour until vomited.

28th.—Medicine was not given hourly, but he took during the night forty grains of ipecacuanha without vomiting or purging. The fever with delirium continued through the night, but in the morning he was perfectly feverless and intelligent; the pulse was reduced to 100, and the epigastric pain was relieved. The child made a speedy recovery under quinine.

The intelligence and credibility of the reporter of this case are beyond question. But it may properly be objected that, in view of the anomalous nature of many of the febrile attacks of childhood, this is not conclusive. It is not presented as conclusive, but as suggestive. But as, so far as I know, there are no published accounts, in this country, of the febrifuge action of ipecacuanha, this is offered as an initial point for confirmation or refutation. It is an old doctrine, not often practised now, that fevers may often be aborted by a timely emetic—that is, by gastric relief. Possibly the emesis is sometimes superfluous. In this instance two scruples of ipecacuanha was taken by a child without any appreciable effect beyond this apyretic sequence. Half the amount of quinine, if given, would have been assumed as a cause. Bearing directly upon this is Case XLII., where the administration of twenty grains was succeeded by a fall in temperature of a

degree and two-fifths, and a further reduction of two degrees was coincident with the use of another scruple, there being no emesis at any time. Case XLIV. may also be consulted. Hospital physicians have excellent opportunities for pursuing this investigation.

XVII. Pneumonia.

The use of ipecacuanha in this grave affection, where it is frequently and judiciously employed, is intentionally omitted from the record and from consideration here. I have had but little personal experience with this disease, and a theoretical argument would not be in place. I have the opinion, however, that its use under cover of the general doctrine here set forth may be pressed much further than has yet been done, but shall not now attempt a discussion of the reasons.

XVIII. In the Puerperal State.

There is a certain amount of documentary evidence, all, so far as I know, of French origin, bearing upon the useful employment of ipecacuanha in the complications that pertain to child-bed. If the statements are those of facts, and I know of no reason to discredit them, they should not be ignored because the asserted results do not tally with our preconceived notions of what ought to happen. It is always to be remembered how this very medicine lapsed into desuetude for so many years in connection with that disease in which, of all others, its powers are most conspicuous; and this very largely because physicians did not see how it could effect the cures with which it was credited.

Doulcet and Désormeaux used it successfully in epidemics of puerperal fever in 1782. Trousseau and Récamier employed it in all the conditions of puerperal origin, regardless of their cause or nature, and always with benefit. Polichronie,¹ citing these facts, attributes the good results to the relief of the gastric embarrassment [by emesis]. Trousseau asserts that "nearly all the complications [*accidents*] that accompany the puerperal state are charmed away by ipecac."² Ringer³

¹ *Op. cit.*, pp. 20-21.

² *Considérations sur l'Ipécacuanha en Médecine.* Thèse par V. Decugis. Montpellier, 1866, p. 45.

³ *Op. cit.*, p. 407.

remarks without comment: "Trousseau recommends ipecacuanha to be taken for some time after child-birth as a useful means to promote the natural functions peculiar to that time." Stillé¹ recapitulates Trousseau's views, also without comment. None of these references are specific and I have been unable to find the original statements.

I have no clinical facts and this is all the literature upon the subject within my reach. But, irreconcilable as it may at first appear, I believe that this material can be appropriately incorporated in the therapeutic edifice that we are constructing. Suggestions as to its place and its adaptation are deferred to a later section.

XIX. Acute Hepatitis.

Reference will hereafter be made to the hepatic complications that frequently occur in acute dysentery, particularly in tropical climates, and the opinion expressed that these complications are more generally coincidental with than a part of that disease. Certainly hepatitis often happens independently, and comparatively recently it has been recognized that ipecacuanha may be usefully employed in its treatment when it so arises. The high authority of Professor Maclean supports this practice, and were his essays on this disease and dysentery adequately read in this country this work would never have been written. But I so respect his teachings that any effort, however humble, to diffuse his practice seems a duty. He says:² "For years past in my lectures at Netley I have urged the free use of this invaluable remedy [ipecacuanha] not only in dysentery, but in suppurative inflammation of the liver. I give it in the same large and efficient doses as in dysentery—from 20 to 25 grains, and even more—and, so far as my experience extends, I am of opinion that it is nearly as efficacious in this disease as in tropical dysentery; the *modus operandi* being the same in both." I think that I violate no propriety in extracting from a private note from Dr. Maclean (28th April, 1875,) this sentence: "In the Acute Hepatitis of malarial climates it is nearly as useful as in dysentery, and unlike mercury it leaves no sting behind it." The only detailed illustration of its use that I have found is the following.³

¹ *Therap.*, 1860, ii., p. 486.

² Reynolds's *System*, 1871, iii., p. 337.

³ *Med. Times and Gaz.*, Apr. 25th, 1874, p. 458.

I transcribe it bodily for convenience of reference. It occurred in the Madras General Hospital, in the practice of Dr. George Smith.

CASE LXXXIII.—“B. M., aged 22, (European) second officer on board the *St. Lawrence*, was admitted on December 5th, 1873. He had just arrived from England by sea, and states that for the last week he suffered from frequent calls to stool, accompanied with severe tenesmus and slight tormina, passing at each motion a small quantity of blood and mucus,—at times none at all. Is called to stool almost every hour, each act of defæcation being followed by slight exhaustion. At present he complains of pain in the right shoulder, and acute tenderness over the right lobe of the liver. Examination: Area of hepatic dulness normal; pain on pressure chiefly over the right lobe laterally and posteriorly; pain increased on deep inspiration; rigidity of right rectus muscle; skin hot and dry; pulse full, 80; tongue covered with a white fur. R. Pulv. ipecac. grs. xx., mucil. q. s, misce; fiat pilulæ iv.; to be taken every sixth hour day and night. [This is not perfectly clear, but I presume the whole scruple was given four times a day. A. A. W.] R. Liq. antim. ℥.xxv., aq. ʒj., misce; fiat haustus; to be taken every third hour day and night in the intervals of the ipecacuan doses. Bran poultices to abdomen and hepatic region every three hours day and night. Diet: milk; milk Oj. extra; soogee, Oj.

December 7th.—Had three motions last night, which were copious, yellow, and watery, containing no blood or mucus. Had fever last night. Temperature at midnight 103° Fahr. Fever left him towards morning in a state of free perspiration. Breathing hurried. Continue treatment.

8th.—Had four motions yesterday, and three during the night; they are yellow, watery, and contain no blood or mucus. Breathing less hurried. Abdominal pain and tenderness in the shoulder less. Continue treatment and give the hypodermic injection of morphia (grs. iv. to ʒj.) ℥.vij. at bedtime if necessary.

9th.—Pain in the shoulder less. Abdominal tenderness has diminished. Bowels have been moved five times during the last twenty-four hours; the motions are not accompanied by tenesmus, and consist of yellow fæculent matter containing no blood or mucus. R. Pulv. ipecac. grs. xx., mucil. q. s., misce; fiat pilulæ iv.; to be taken morning and evening. Other medicines to be continued.

10th.—Had no fever yesterday; no tenderness of abdomen, or pain in the shoulder; respiration easy; had four motions yesterday, which were yellow and watery; tongue foul. Vomited last night after the dose of ipecacuan. Continue treatment.

11th.—Has no abdominal tenderness or pain in the shoulder. The bowels were opened twice yesterday, and five times during the night; the motions are scanty and watery—probably due to the milk in his diet. Omit the extra pint of milk ordered, and continue one dose of the ipecacuan at bedtime. Continue treatment.

12th.—Had one motion yesterday without tenesmus, which was scanty, yellowish, without blood or mucus; has no abdominal tenderness; his tongue is foul. Omit the ipecacuan; continue the antimonial mixture three times a day.

13th.—Had two semi-consistent motions yesterday, none last night; they were of a brown color. Tongue cleaner this morning. Continue treatment.

15th.—Bowels regular; had two motions yesterday; tongue clean; complains of slight pain in the right loin over the kidney; reaction of urine,

acid. Omit antimonial mixture. R. Pot. bicarb. gr. xv., aq. oryzæ calidæ $\bar{\text{z}}$ iv., misce; fiat haustus; to be taken three times a day.

17th.—Is doing well; bowels regular; tongue clean; urine feebly acid. Continue treatment.

19th.—Appetite improving; bowels regular; tongue clean. Chicken diet.

20th.—Discharged at his own request, feeling quite well.

The following is an abstract of the only case that has fallen under my personal observation. I regret that full notes were not taken, and that what were made were not preserved; so that I can only offer my opinion of this case without detailing the facts which led to it.

CASE LXXXIV.—In the summer of 1875 a soldier was taken ill at Atlanta with a chill, a violent and persistent fever, pain in the right shoulder and extreme tenderness in the hepatic region. Acute inflammation of the liver is not common in that locality, but, from the symptoms and from an obscure history of a similar attack in New Orleans, I became satisfied that the case was one of hepatitis, probably an acute exacerbation of a chronic state. I treated him for several days in the usual manner but he steadily grew worse, when, suddenly remembering Maclean's advice, I gave him large doses (twenty to thirty grains) of ipecacuanha about three times in the twenty-four hours. There was occasional vomiting but he immediately began to rapidly and regularly improve. He was ultimately discharged the service on account of inability to wear his belts on duty, but the acute disease disappeared while he took the medicine in large doses and took only it.

XX. As an Antidote to Venom.

"When applied locally in the form of poultice or paste to venomous bites or stings it often allays in a remarkable manner the pain or irritation, and, in such cases, is regarded by some as almost a specific."¹ I have no personal experience with that use of it.

In common with many other drugs it has a certain popular reputation in snake-bite, and having seen in a missionary's letter² from South Africa the statement that another "missionary says that he has found rubbing ipecacuanha moistened with water into the wound, and also some used internally, very useful," I wrote to Natal to solicit the facts on which it was based. In reply the correspondent sent an extract from a book³ of African residence containing substantially the statement quoted, but qualified by the fact that the author had "had no opportunity of testing its efficacy in any severer cases than those

¹ Waring; 1st Am. ed., p. 388.

² *N. Y. Observer*, 12th Aug., 1875.

³ *Eleven Years in Central Africa*,* by Rev. T. M. Thomas; London.

of the night-adder, which seldom result fatally even when no remedy is used." He adds, however, "but I much prefer it to ammonia, and have much greater confidence in it than in that remedy." That is presumably the opinion of an unprofessional but practical man. With this extract the letter-writer kindly sent notes from three reliable medical men practising in the colony, none of whom had faith in the drug in that condition and therefore had not so used it.

Von Martius¹ quotes Piso as attributing antidotal powers in snake-bite to ipecacuanha and says that, while he has no practical experience with it, he has received much corroborative testimony as to its power in two-ounce doses. At the suggestion of Sir Robert Christison, who quoted Von Martius, whom he regards as "of the highest authority as a botanical traveller," Dr., now Sir Joseph, Fayrer caused three experiments to be made, using a cobra. These, he says, "appear tolerably conclusive;"² and he looks upon the drug as not of the slightest use.

Notwithstanding Sir Joseph Fayrer's very high authority, it seems to me that a little further investigation of the subject, especially with American serpents, might profitably be made. Bearing upon it I am able to contribute two instances of presumed snake-bite, that are of sufficient importance to be designated as cases, furnished at my request by Hospital Steward Philip Newshafer, U. S. Army. Hospital Steward Newshafer is a meritorious non-commissioned officer of intelligence, upon whose statements of facts I rely implicitly.

CASE LXXXV.—In August, 1870, while returning from a walk with his two dogs, (pointers,) near Fort Lyon, Colorado, he observed that the neck of one of them was considerably swollen, and, a little blood showing the spot, he found that it had been bitten near the throat. This he presumed was done by a rattlesnake, of which there were many among the rocks where the dogs had been running. He washed the wound with cold water, after which the dog began to stagger, foaming at the mouth, and soon fell on his side in convulsions. The Steward's own words are: "In lieu of anything better I gave him several half-ounce doses of the fluid extract of ipecac., which caused him to vomit freely, and after repeated applications of cold water to the wound the convulsions passed off, and the dog was able to follow me about, but being very weak and exhausted." In a day or two the wound began to suppurate freely, the swelling on the neck gradually subsided, and the dog entirely recovered.

CASE LXXXVI.—A little later in the same year a dog belonging to a soldier, suffering in the same manner, was brought to the Steward. It

¹ *Specimen Mat. Med. Braziliensis*,* Munich, 1824, p. 8.

² *Taanatophidia of India*, 1872, p. 144.

was bitten in the fore-shoulder, where also an inflammation took place. This dog also recovered after the same treatment.

Steward Newshafer adopted this treatment entirely of his own motion.

XXI. Topical Effects.

Turnbull¹ proposed it as a substitute for tartar emetic ointment as a counter-irritant, from the fact that, when rubbed on the skin (two drachms of the powder to two of olive oil or four of lard) a few minutes once or twice a day, it produces a crop of persistent, painless pustules, that leave no scar. But Duckworth² says, that if persisted in severe ulceration follows.

It is of value in local inflammations that frequently occur in ordinary practice.

CASE LXXXVII., condensed from the report of Dr. Noël Guéneau de Mussy,³ Physician to the Hôtel Dieu.

Early in 1872 he received into his wards a poorly-fed, emaciated and feeble infant eighteen days old. The mother was weak and anæmic, but free from venereal taint. From the red, closed and swollen eyelids oozed an irritating, muco-purulent matter that excoriated the adjacent skin. The eyelids could only be raised with great difficulty, when the mucous lining, scarlet, swollen and velvet-like, protruded between the purulent streams that escaped from the surface of the eye-ball. The left cornea was dull and rough, with a small ulceration occupying its centre. A light whitish cloud darkened the right cornea.

The eyes greatly improved and the acute symptoms subsided under the nitrate of silver solution that for more than thirty years he had scarcely known to fail in the purulent ophthalmia of the new-born. The purulent secretion nearly dried up, but the inflammatory process was not quite extinguished and the conjunctivæ remained swollen, red and slightly granulated. The corneæ presented the same appearance. After touching them for four days with a crayon of equal parts of nitrate of silver and nitrate of potassa there was no change, the ulceration and the opacity of both corneæ remaining unmodified.

He then ordered half a drachm of the ipecacuanha root to be boiled in five ounces of water for ten minutes, and when cool to be strained. This was dropped into the eye four times daily. The application at first seemed painful, but it was soon easily borne, and the affected parts speedily improved. In twelve days the granular condition had disappeared, the conjunctivæ recovered their natural color, the right cornea was quite healthy, only a slight opacity was observable in the left, and some days later the child left the hospital entirely cured.

My own cases were much less grave, but they are entitled to record from their novelty.

¹ *Lancet*,* May 7th, 1842.

² H. C. Wood's *Therapeutics*, 1st ed., p. 364.

³ *Practitioner*, Sept., 1874, pp. 185-7.

CASE LXXXVIII.—W. D., not on sick report, applied for relief from an annoying sub-acute conjunctivitis, Atlanta, September, 1875. One ounce of water was several times filtered through ten grains of ipecacuanha, and a few drops were used locally several times daily. In two or three days the inflammation disappeared.

CASE LXXXIX.—A. E., Savannah, November, 1875. This man's eyes were much inflamed, the conjunctivæ being injected and roughened, with a tendency to granulation of the lower lid. He was treated in the same way as the preceding case and in two days the eyes were well.

This long clinical record has been set forth not to claim for this drug the power of a panacea, nor to suggest that it is the only remedy suitable for the various conditions recited, nor yet to insinuate that it will prove invariably successful in any one of them. Unfortunately, medicine is an incomplete science, and its disciples frequently have but short supplies of straw with which to make most necessary bricks. It is proper, therefore, for every one to contribute, simply and without exaggeration, such facts as add to the common store. In that spirit these cases, all of which are believed to be perfectly authentic, are offered to the profession. But as they refer to qualities of ipecacuanha that many ignore, and especially as they bear upon an hypothesis the reverse of what is generally accepted, they have been detailed at length. The reader and the writer thus possess the material in common, for it would be presumptuous to ask acquiescence in deductions without the fullest exhibition of the facts.

PART II.

THERAPEUTICAL OPINIONS.

I. Current Views of Ipecacuanha.

THE first step is to recapitulate the prevailing views as to the power of ipecacuanha, and then to rehearse the opinions of authorities as to its action in dysentery; for it is their prevalence that has brought about this paper.

This paper treats of ipecacuanha as a whole. Some of the later therapeutical experiments abroad have been made with emetia, "pure" and "impure," which certainly is an active agent; but in whatever form administered it is usually, and often violently, emetic, and in excessive or repeated doses it is surely dangerous. I have had no experience with it, but I greatly question whether the chemical mutilation to which the vegetable is subjected by its extraction does not radically destroy some essential quality.

Fifty years ago Sunderlin,¹ of Berlin, taught that emetia exercised an exhausting stimulus over the eighth pair of nerves. I am not aware that others have admitted it, or that it has been kept in view in practice. Headland² describes ipecacuanha as a special nervous sedative, and thinks that it acts on the vagus and cannot act on the sympathetic.³ In repeated small doses its action is particularly directed to the pulmonary organs; in larger doses it produces first nausea, then vomiting. He thinks it is an indirect expectorant, adding to its neurotic influence a true eliminative agency,⁴ and an indirect diaphoretic when given in emetic doses.⁵ He summarizes its powers as resembling those of antimony except in the latter's blood-action, having

¹ *Handbuch der Speziellen Heilmittellehre*,* 1825, ii., p. 28, quoted by Duckworth, *St. Bart. Hosp. Rep.*, v., 1869, p. 221.

² *Action of Medicines*, 3d Am. ed., 1859, p. 303.

³ p. 305.

⁴ p. 341.

⁵ p. 306.

previously described antimony as a powerful special nervous sedative. Pereira¹ clearly limits its power in large doses to that of an emetic. Dr. G. B. Wood² describes it as a tonic, "probably owing to a very gentle exercise of its irritant property," in very minute doses; as a diaphoretic and expectorant with a special tendency to the pulmonary apparatus, in somewhat larger doses; in still larger, as a nauseant; and in the full medicinal dose, "as a rather prompt and efficient emetic." Elsewhere³ he says substantially the same. In Stillé's⁴ elaborate work I do not find that he directly styles ipecacuanha a depressant; but he devotes some space to the sedative action of emetics,⁵ under which group he classes this drug. Waring⁶ regards it as a sedative. H. C. Wood⁷ remarks, "its physiological action is not as yet well made out;" but that seems to refer to the avenues employed rather than to his idea of the goal attained, and I find nothing to lead away from the depressant notion. Ringer⁸ says: "It is a mild, tardy, but certain emetic. It produces repeated vomiting." He admits that its mode of action is yet unsettled, but suggests⁹ that it may possibly act upon the nervous centres governing vomiting. The later special students of ipecacuanha thus express themselves. Pécholier¹⁰ explains its reputed benefit in many diseases by its emetic and evacuant effects in those which are complicated with gastric disorder. He finds it very depressing (*hyposthénisante très-prononcée*) upon rabbits and frogs, and believes its legitimate action to be temporarily depressant upon the nervous system, the ephemeral duration depending on its elimination.¹¹ In some cases there is temporary reaction after the severe depression.¹² He claims¹³ Giacomini and the whole Italian school as agreeing with him in classing it among the counter-stimulants. Duckworth¹⁴ supposes that emetia excites the vaso-inhibitory filaments of the vagus, resulting in inaction of the motor branches and a condition of paralysis or passive dilatation of the blood-vessels presided over by this nerve. But the same writer also says¹⁵ of it: "an irritant action may directly excite the vaso-motor centre and so cause increased contraction of the

¹ 3d Am. ed., 1854, ii., p. 624.

² *Therapeutics*, 2d ed., 1860, ii., p. 444-5.

³ *Dispensatory*, 13th ed., 1872, p. 497.

⁴ *Therapeutics*.

⁵ 4th ed., ii., p. 437 *et seq.*

⁶ 2d Am. ed., p. 356.

⁷ *Therapeutics*, 2d ed., 1876, p. 409.

⁸ *Op. cit.*, p. 393. ⁹ p. 394.

¹⁰ *Recherches expérimentales sur l'action physiologique de l'ipécacuanha*, 1862, p. 7.

¹¹ pp. 47-9. ¹² p. 51. ¹³ p. 50. ¹⁴ *Op. cit.*, v., p. 222. ¹⁵ vii., p. 100.

smaller arteries and possibly of the capillaries," either directly or by reflex action through the vagus. These suppositions appear to attribute directly opposite properties to the drug. Chouppe¹ says: Ipecac. absorbed by any channel seems at the very moment of its absorption to produce an anæmia with dryness of the intestinal mucous membrane; perhaps if the action of the medicine is prolonged, it is eliminated more abundantly by the gastro-intestinal mucous membrane (which is not yet irrefutably proved) than by other emunctories, and it may produce inflammation and hæmorrhages. He admits² the great difficulty of determining how it acts in the profuse sweating of consumption, but suggests that it may through the vaso-motor system. Polichronie³ concludes that no vaso-constrictor action is exerted by it, but that it diminishes arterial tension, and it probably induces a revulsive action which results in inflammation of the mucous membrane of the intestine, and that it acts in the diarrhœas by substituting for the pathological inflammation an open (*franche*) inflammation which spontaneously tends to recovery. He thinks it checks profuse sweating, either by being eliminated through the sudoriparous glands, thus drying up (*tarir*) their secretion, or by its revulsive intestinal action.

To sum up: The common understanding of the action of this drug is, that, in other than very small doses, it vomits. Ipecacuanha and emesis are as inseparable, popularly, as opiate and anodyne. With very rare exceptions the professional teachers confirm the popular view, and among those whom I have been able to study I cannot point to one, unless Maclean may be so interpreted, (and Sunderlin may be an exception,) who clearly attributes to it any other than a depressant or sedative power. Chouppe, approaching nearest the opposite view, does not logically follow up his facts.

II. Opinions as to the Reasons for and the Manner of its Use in Dysentery.

There was presented in the first part of this work a synopsis of the current professional views upon the employment of ipecacuanha in dysentery, and the section just preceding this epitomizes the doctrines now taught as to the general powers of the drug. I add a brief

¹ *Le Progrès Médical*, No. 29, July 18th, 1874. ² No. 30. ³ *Op. cit.*, p. 97.

summary of the opinions that have been and are held as to the reasons for and the manner of its use in that disease; and in so doing must sometimes trench upon points already discussed, for the subjects are inextricably blended.

Piso, who brought it to the notice of the civilized world in 1649, speaks of it in these enthusiastic words, as quoted by Pringle¹ and Moseley:² "*Dehinc ad radicem ipecacuanhæ tanquam ad sacram anchoram confugiendum, qua nullum præstantius aut tutius, cum in hoc, tum in plerisque aliis, cum, vel sine sanguine, fluxibus compe-scendis, natura excogitavit remedium.*" He looked upon it as an expulsive agent that, by purging or vomiting, drained the affected part of morbid humors and left it constricted. Although emesis frequently occurred, he evidently did not regard that as essential, either for the cure of the disease or to the proper action of the drug. He says: "*Quippe præterquam quod tuto et efficaciter tenacissimos quosque humores per ipsam alvum, sæpissime autem per vomitum ejiciat, et a parte affecta derivet, vim quoque astrictivam post se relinquit.*" He advised two drachms of the root to be boiled, or to be macerated for a night in four ounces of liquid, the liquor of which may be taken with or without an ounce of oxymel. (This differs somewhat from the recommendation attributed by Stillé³ to Piso and Helvetius. I have not been able to consult the original, but Pringle and Moseley agree in their quotation.) On the next day a second or third decoction of the same root is to be repeated according to circumstances. This, as more astringent, he thought the weaker patients bore better.⁴ Helvetius, through whom it was actually introduced into European practice about 1682, wrote a treatise upon it that I have not seen. Baglivi, 1696, is quoted by Trousseau⁵ and Moseley⁶ as declaring that it is a specific and an almost infallible remedy in dysenteric fluxes. Moseley adds that Baglivi says he was so informed by Dr. Sherrard in England, and Dr. Mangetus, of Switzerland. I have been unable to consult the original. Baglivi and Sir Hans Sloane popularized it in England early in the eighteenth century. Mead⁷ advised, first bleeding, "*dehinde*

¹ *Observations on Diseases of the Army*, 7th ed., 1775, p. 261.

² *Tropical Diseases*, 1787, p. 282.

³ 1st ed., ii., p. 487.

⁴ Gul. Pison., *Hist. Nat. et Med. Ind. Occid.*,* lib. ii., cap. ix.

⁵ *Clin. Med.*, i., p. 540.

⁶ *Op. cit.*, p. 304.

⁷ *Monita et Præcepta Medica*, 1751, p. 110.

vomitus utilissimus est; quem vino ipecacoanhæ non semel sed ter quaterve interposito biduo vel triduo elicere optimum erit." A very interesting clinical paper by Dr. Samuel Pye¹ details about three hundred instances of various diseases where repeated vomiting followed two-grain doses. In all these cases emesis was sought, but it does not appear whether or not the action of the medicine was assisted by draughts of fluids. The series is not confined to dysentery, but anticipates, except that it was always employed emetically, many of the uses of the drug to which this paper is devoted, and includes the cases of some very young children. Dr. Pye expresses no opinion as to the reason for the success "of this noble medicine," "efficacious to root out every offending humour," except by the implication that it is evacuant. The paper is worth study as supporting some modern practice. Cleg-horn, in the Minorcan dysentery, used it as an evacuant. Tissot says that while it is not a certain specific, it is very useful as an emetic. Akenside found that in one-grain doses it produced its salutary effects in all kinds of dysenteries. He regarded it as an evacuant by the bowels and an anti-spasmodic. Baker, in the London epidemic of 1762, and Monro, with the troops in Germany, 1761-3, rejected it as of no particular value, except as an occasional emetic. Moseley,² from whom these references are taken, used it principally as a sudorific, either with or without emesis.³ He looked upon diaphoresis, however produced, as the curative process. I do not find that Sydenham, in the epidemic of 1669-72, used ipecacuanha, but his editor, Dr. Swan,⁴ esteemed gentle emetics of it in the beginning a specific. Taken later, "it will indeed in some measure check these evacuations, but increases the anxiety," or distress. Cullen⁵ says: "Ipecacuanha seems to possess no specific power; and it proves only useful when so managed as to operate chiefly by stool." Pringle⁶ induced vomiting by twenty grains to which one or two grains of tartar emetic were added. He also observed that the effect was better when it likewise operated by stool. He thought a more certain method was to give

¹ *Medical Observations and Inquiries*, London, 1757, p. 240.

² *Op. cit.*, pp. 309, 315, 323, 340, 343.

³ pp. 171, 197, *et al.*

⁴ *Entire Works of Sydenham, with Notes*, 2d ed., 1749, p. 148.

⁵ *First Lines, etc.*, 4th ed., 1784, iii., p. 64.

⁶ *Op. cit.*, pp. 261-2.

five grains of ipecacuanha every two hours, twice or thrice, till purging occurred, which usually was soon after the third dose. The patient took no drink till his bowels were moved. Should any bad symptom remain by the fourth day, the ipecacuanha in divided doses was repeated, or a rhubarb and calomel purge used. He lays stress on the necessity for repeated evacuations. Stillé¹ remarks that Pringle "indeed laid it [ipecacuanha] aside on account of the distress produced by its action." I do not so understand him in the edition² I use. But he does say³ that he desisted from using the glass of antimony, partly on account of "the roughness of its operation," and substituted ipecacuanha and tartar emetic. (Glass of antimony is an active antimonial, but of variable composition and unequal operation. When of good quality it consists of about eight parts of teroxide to one of tersulphuret.) A plain and interesting letter will be found in the *Memoirs of the Medical Society*,⁴ detailing the invariable cure of severe dysentery, in a ship's crew in the Senegal river, by 2-4-grain nauseant doses of ipecacuanha.

The first physician publicly advising it in large non-emetic doses appears to have been Balmain,⁵ whose paper was read January 16th, 1797. His assistant, following the practice of an anonymous and, it has been supposed, irregular practitioner, gave "ninety grains of the powder, with forty drops of tinct. opii, to a man whose life was apparently near to a close and with whom evacuants had been used. There was a wonderful abatement of every symptom in the course of one night; and a repetition of the medicine in smaller quantities completed the cure in a few days." Mr. Balmain immediately adopted this practice, and found that with recumbent rest "nausea seldom or ever followed it." Some years later Mr. Playfair,⁶ in Calcutta, followed this method. Unable to consult the originals, I do not know their views of its action. Unfortunately, their practice was not generally followed, although in one form or another ipecacuanha was of "long-standing reputation in the south of India."⁷ James Johnson influenced for more than a generation the treatment of dysentery by mercurials and venesection, and his authority and Ranald Martin's, his

¹ 3d ed., 1868, ii., p. 390.

² 7th ed., 1775.

³ pp. 260, 263.

⁴ London, 1792, iii., p. 517.

⁵ *Mem. Med. Soc. of London*,^{*} 1799, v., p. 210.

⁶ *Edin. Med. & Surg. Jour.*,^{*} 1813, ix., p. 18.

⁷ Johnson, *Tropical Climates*, Am. fr. 6th Eng. ed., 1846, p. 239.

editor, were thrown against ipecacuanha except as an auxiliary of an emetic nature in simple dysentery.¹ I have not been able to consult Sir Ranald Martin's own work on tropical climates on this point. Pereira² admits it to be an efficacious auxiliary, but doubts that purgation is its *methodus methendi*. "In severe forms of the disease [dysentery] no one, I suspect, would now [1854] think of relying on it as his principal remedy." He³ regards its anti-dysenteric influence to be partly due to its diaphoretic properties and its tendency to produce intestinal anti-peristalsis. He then observes, without comment, "Mr. Twining gave large doses (gr. vj.) with extract gentian without vomiting." Copland⁴ advises, always after depletion, small or large doses of ipecacuanha, depending upon the severity of the symptoms, with the view of determining to the skin, in sthenic dysentery. His American editor, C. A. Lee, after expressing his skepticism of "specifics" in this disease, says,⁵ "if any medicinal agent deserves to rank as a specific in dysentery it is undoubtedly ipecacuanha." He gives it in small doses to cause revulsion to the surface. G. B. Wood⁶ insists that the very prompt way in which "it is said that the remedy sometimes acts" in dysentery can be explained by the diminished force of the circulation, the depletion, the derivation to the surface by perspiration and to the stomach by its local irritation, the increased secretion from the irritated surface and the catharsis, "without calling in the aid of any specific power." In the *Dispensatory*⁷ he observes, "In dysentery it has been supposed to exert peculiar powers," but he says nothing as to their nature nor how they are exercised, nor does he give a hint that it may be employed in bowel affections, otherwise than in quarter- or half-grain doses, except as an emetic. Stillé⁸ says that in small doses it is laxative. He thinks that in dysentery it will be only of "advantage over other vegetable emetics or mild cathartics when the disease is epidemic or assumes a bilious character with bitterness of the tongue and a foul mouth." He describes the modern Asiatic method and recites all that its advocates claim for it, but he does not commit himself to the practice. Waring⁹ gives it the weight of his personal experience without offering a theory of its action beyond

¹ *Op. cit.*, pp. 203, 233, 240.

² *Loc. cit.*

³ p. 628.

⁴ *Med. Dictionary*, Am. ed., 1855, i., pp. 824-5.

⁵ p. 842.

⁶ *Therapeutics*, 2d ed., 1860, p. 447.

⁷ 13th ed., 1872, p. 497.

⁸ *Therapeutics*, 3d ed., ii., p. 390.

⁹ *Loc. cit.*

what may be based on his preliminary remark that the medicine possesses considerable sedative powers. Maclean¹ thinks it owes much of its usefulness in this disease to its evacuant action, and that it is an effective blood depurant. "It appears to increase the secretion of the whole alimentary canal, as well as that of the liver and pancreas." Were his admirable papers on dysentery properly studied in this country, much of this essay would be utterly superfluous. H. C. Wood,² the latest systematic writer on therapeutics, lays more stress on its utility in dysenteries in his last edition (1876) than previously; but he still thinks its beneficial action is best seen in the bilious and malignant forms, since its use is most common in tropical climates. That the disease is more common in those climates and may be better understood there, plausibly explains that fact. He says, however, it "appears to exert a direct influence upon the hepatic and intestinal glands, and may be tried with great hope of success whenever there is decided glandular derangement."³ To explain the tarry discharges induced by it in bilious dysentery, he refers to the mechanical effect of the vomiting, but adds that that does not seem "at all sufficient to account for the results, especially as some observers state that the effects noted are produced even when little or no vomiting occurs." Dr. Wood classes ipecacuanha among the local remedies as an emetic, but admits⁴ that "its physiological action is not as yet well made out." In dysentery he thinks⁵ it best to produce emesis and then to give five-grain pills every two or three hours, taking precautions to retain as much of it as possible; or to give scruple doses every two, four or six hours, when "it is said that after two or three doses tolerance is established and the drug retained." While avowing the desirability of its retention, he evidently still believes a certain amount of vomiting unavoidable when it is given in large doses by the mouth. In this edition he gives prominence to its use by the rectum.

It has seemed to me only just to present these quotations, which do not claim to be exhaustive, to show the drift of the authorities upon the use of ipecacuanha in dysentery.

¹ *Op. cit.*, p. 121.

² *Op. cit.*

³ p. 411.

⁴ p. 409.

⁵ p. 412.

III. As to Neurotic Action, especially Depression and Stimulation.

It will be convenient at this point to refer to certain forms of nervous influence. The exact nature of nervous force has hitherto eluded research, and we really know little or nothing of the precise manner in which it acts: nor is it necessary for our purpose to do more than to assume its existence. We simply have certain conditions which we call consequences, for which we assume certain causes. In this manner we use the terms stimulation, depression, sedation, exaltation and the like. But, after all, these are merely labels or handles that for convenience we attach to our bundles of facts, which after a time may be discarded for better ones. Thus, the gangrene of ergotism is due to a persistent contraction of the smaller blood-vessels, supposed to arise from constant vaso-motor spasm, and we call ergot a nervous stimulant. Section of the nervous tissue is followed by excessive hyperæmia or serous effusion, as the case may be, and with great apparent reason we call the section of the nerve its paralysis—profound depression—and attribute the morbid conditions that are then seen to the absence of its control. These are extreme cases, but they may be taken as types of stimulation and depression. Now, from analogy it is reasonable to suppose that the morbid influences which ultimately manifest themselves by great prostration of the patient are depressants, operating in different ways but of the same general tenor. Cholera morbus, the poison that induces pernicious intermittent, exhausting hæmorrhage, are illustrations.

To expand the theme a little, we may imagine the nervous influence in health to be represented as in a state of equipoise, and that as it is deranged in one direction or the other some disturbance will occur. The various nervous forces may be capable of many permutations, depending upon the point at which pressure is applied or upon the removal or introduction of some check or balance, and these alterations will affect the general health or special functions. Take, as an example, the matter of vomiting. While the dynamics of vomiting, the mechanical operation of the function, is fairly understood, its essential cause or causes are yet obscure. Flint¹ observes: "It is undoubtedly induced by causes which operate through the nervous

¹ *Phys.*, ii., p. 306.

system. * * Irritation of the sympathetic nerves, particularly those of the abdominal ganglia, will produce vomiting. * * There are many avenues for the passage of these impressions to the nervous centres. * * The action of emetics which operate through the blood * * is probably induced by the direct impression made by these substances on the nervous centres." Among such emetics sulphate of zinc and mustard may fairly be classed as stimulant, no one using the ordinary phraseology would speak of them as depressant—mustard flour especially being sometimes used in the nervous collapse of pernicious chill.¹ But, on the other hand, we certainly often have emesis as a direct result of nervous depression. As Professor Carson² remarks: "In many cases a state of exhaustion or loss of nerve-generating force is at the foundation of this excessive susceptibility to impressions that occasion vomiting." "This is seen in the sickness of stomach attendant on the loss of blood." "Disagreeable sights, odors or tastes, or even recollections of them, may affect the brain sensationally and operate in the same way." This, we may presume, occurs by reflex action upon the sympathetic, just as fear sometimes causes intestinal or cutaneous relaxation. We know that vomiting will occur under the two opposite conditions described, and the hypothesis advanced plausibly explains it under each. Now, to anticipate a little, if we suppose ipecacuanha to be a nervous stimulant or tonic we have an agent that exactly complies with the required conditions. Administered in health it exalts one side of the beam, and with the disturbed balance tonic vomiting, as it may be called, occurs. But its efficacy in the vomiting of exhaustion or depression is shown in the severer cases of dysentery, those of cholera morbus and the morning-sickness of pregnancy reported in the earlier pages. This notion of the action of ipecacuanha is here introduced only incidentally and will be elaborated later. It is now used simply to give point and effect to the hypothesis of nervous action presented; for some explanation of this kind seems necessary to account for what we know of the function of vomiting and of the means to induce and to control it. But if this view of nervous operation is true of one function, or of one set of actions, it must be true in a general way of the nervous system at large. All neurotic problems are not as simple as that suggested, but it may be

¹ H. C. Wood, *Therap.*, 1st ed., p. 369.

² *Phila. Med. Times*, ii., p. 344.

used as a type. And while our positive knowledge, particularly of the sympathetic system, is obscure and inconsiderable, we believe that it presides over organic life, we know that it is intimately connected with the cerebro-spinal system, and that they together keep in operation the vital functions upon which, and upon each other, they have both a direct and a reflex action. However one or the other is disturbed do we find a disease more or less defined and more or less serious. This may flow from the direct depression of some nervous element, or as one is debilitated and loses its proper control another force is brought into greater play, and it is the jarring of these discordant and abnormal conditions that we call disease. For example, speaking roughly, if, as H. C. Wood supposes, there is a chemical heat centre in the pons, and for the sake of argument it may be admitted, the destruction or suspension of the force holding it in check permits the occurrence of a furious fever that in turn destroys life itself. We thus bring up the idea of a many-stringed instrument whose harmonious operation requires complete accord, and an instrument so complex that the loss of power in one part may be followed by an excessive evolution in another. These figures are not intended to imply that disease is always and essentially a nervous depression—although it probably is to a greater degree than is often admitted. For there is every reason to suppose that at times an excess of stimulus, as, for instance, in strychnine-poisoning, may be the starting-point.

Under this hypothesis we are not called upon to decide the nature of the nervous force. It may be a subtle fluid of the class typified by electricity; it may be vibrations of the nerve-tissue or of an intermolecular ether; it may be in an utterly unimagined form, correlated with the other imponderables. Nor are we required to explain its exact mode of operation. But by using such an hypothesis, by imagining the nervous element in a state of unstable equilibrium whose disturbance constitutes many forms of disease, we are materially aided in our comprehension of some diseases and of the action of some remedies. And throughout this work where nervous stimulation or depression is referred to, the reader will please to remember that this hypothesis was in the writer's mind.

IV. Of the Nature of Dysentery.

I now desire to discuss the probable nature of dysentery, which is too generally in practice, if not in theory, regarded as essentially an inflammation that should be violently extinguished.

There is no better general description of it than Professor Maclean's:¹ "A specific febrile disease, characterized by nervous depression; by inflammation and sloughing of the glandular apparatus of the mucous membrane of the large intestine (sometimes extending into the small gut); by tormina and tenesmus, with scanty mucous and bloody stools of a peculiar odour, changing as the disease advances to serous, and giving off a gangrenous effluvia." That is a picture of a serious case; but I believe that the pathological *résumé* includes results as well as causes. The first clause—"a specific febrile disease, characterized by nervous depression"—represents the nature of the disease itself. The tormina and tenesmus and the stools are symptomatic, and the organic changes are the results, not the essence, of the disease. Why it is chiefly manifested in the great intestine we do not yet know—we may never know. But when this nervous depression does chiefly show itself there we designate it dysentery: equal nervous depression in other organs are called by other names, that is, we then speak of other diseases. But a common view of dysentery is to regard the fever, the pain, the frequent discharges and, above all, their bloody character, as indicating an excess of action, an abnormal excitement that must be controlled and calmed by depressants. But the pyrexia in an intermittent, the neuralgia of an anæmic woman, the frequent stools of cholera, the draining from an imperfectly contracted uterus are, none of them, ever regarded as indications for sedative treatment. That is to say, not one of these symptoms is, *per se*, an indication or a reason for the induction of depression. Do they become so when combined as dysentery? The futility, especially in the more violent and epidemic forms of the disease, of venesection and mercurialization, which are among the most powerful depressants, speak against its likelihood. Still the professional mind, taken up with the organic changes seen at the autopsy, the thickened, brittle, contracted colon, the ulcers of various type, and, it may be, the mucous membrane itself gangrenous, too often fails to look at

¹ Reynolds's *System*, i., p. 106.

what may be the beginning of it all. In this regard I cannot avoid thinking that Professor Maclean, for whose opinions at large I entertain the most profound respect, unnecessarily complicates the subject when he supposes¹ that it is "caused by the action on the blood of a poison having a peculiar affinity for the glandular structures of the large intestine." Specific reasons will be given later.

I believe that dysentery at its inception is the manifestation of a peculiar ganglionic intoxication, and regard the intestinal inflammation, with its consecutive ulceration, as a result of the malady but not the primary or radical affection. Trousseau graphically expressed such an idea when he said: "*l'ulcure est comme un bourg brûlé; ce n'est pas la guerre, c'est l'effét de la guerre.*" And James Johnson,² although advocating the depleting and mercurial treatment, regarded inflammation rather as a sequence than as a cause of dysentery. If, at the beginning of an attack of acute dysentery, the pain and distress and the bloody and mucous stools are the measure of a true inflammation, a process involving nutritive change,³ it would be incredible that one or two doses of any medicine should obliterate those alterations and restore the tissues to their natural integrity. But over and over again do we see ipecacuanha, properly administered, sweep away at once all signs of illness. If, however, we admit that the first step of the disease is a relaxation of the ordinary nervous tone of the part, we are in a position to satisfactorily account for the phenomena. Under such a view the capillaries released from nerve control immediately leak, the glands with an unbalanced nerve supply fail either in the quality or the amount of their secretions, the blood supply increases and stagnates in the vascular maze, soon transforming it into a wilderness whose neo-plastic growths, like tares and brambles, add to the desolation. But if at any time before the structural changes set in (which is the point that I look upon as the commencement of inflammation) the nerve-control is reinstated, we then find the congestion removed, the glands properly fulfilling their offices, the capillaries no longer exuding blood and serum, and, *pari passu*, the abnormal sensations disappearing. That is, the process whose continuance would have developed inflammation is abruptly aborted. And it is a

¹ p. 108.

² *Tropical Climates*, Am. fr. 6th Eng. ed., p. 212.

³ Flint, *Phys.*, i., p. 299.

main object of this paper to show that ipecacuanha may exert just such control. That simple view of the matter seems to me to entirely explain the incidents. Later in the disease, when plastic changes have occurred, we must suppose that the nervous depression persists and aggravates them, so that to the very last the indication is to neutralize it in the hope that, the proper balance being reëstablished, the restorative power of nature will gradually lift the patient to the line of health, permitting the repair of the ulceration and the absorption of the extraneous matter. But it is altogether probable that the condition of ulceration is not nearly so persistent in either form of dysentery as is generally supposed. For, as Maclean¹ says, "we constantly see cases [of chronic dysentery] in which not a single breach of continuity is found," although there may be abundant evidence of its previous existence. The not infrequent spontaneous cure of dysentery in temperate climates need not be interpreted as distinguishing it from tropical dysentery except in degree. In this milder form the original nervous depression being less and the exciting cause being suspended, nature's elasticity will often restore the proper tone. But the suffering, the frequent deaths, and the lingering sequels draw it within the same class.

True dysentery is rarely if ever caused by indigestible ingesta. Improper food may aggravate the disease, may delay recovery, or may provoke a relapse, but it can seldom be charged with inducing it, except indirectly, as through scorbutus. But where there is the faintest suspicion of a scorbutic taint, that must be carefully treated by appropriate diet, as Maclean² most strenuously insists. The reason is obvious; for scurvy indicates a radical deficiency in the constituents of the blood, which must be supplied before the nerve-depression that it constantly fosters can be overcome. On the other hand, omitting entirely the disputed but most probable point of contagion, it springs from sources whose other morbid effects are universally admitted to be forms of nervous derangement. The most prominent of these is the poison of malaria. To attempt to define malaria here would lead us into an erratic and profitless discussion. But it is beyond denial that it is a prolific source of this disease, and I make no apology for using a few sentences from Aitken³ as a condensed statement of facts.

¹ *Op. cit.*, p. 118.

² *Loc. cit.* and *Lancet*, Am. reprint, July, 1871, p. 382.

³ Am. fr. 4th Lond. ed., pp. 581-2.

"It may be stated, as a general proposition, that there is no country where paludal fever exists in which dysentery is not an endemic and prevailing disease." "This connection is so intimate that a given number of persons being exposed to the action of paludal miasmata—as, for example, a boat's crew sent ashore in a tropical climate—the probabilities are, that of the men returning on board, part will be seized with dysentery and part with remittent fever. Paludal fever and dysentery, moreover, are not only conjoined in locality, but they often coexist, precede, or follow each other in the same individual, so that the fever frequently ends in dysentery, and the dysentery in remittent fever." This is also true of intermittent fevers. "But dysentery also prevails where there is no other evidence of the presence of malaria. Nevertheless, the evidence in favor of malaria being the common, though probably not the sole cause of dysentery, appears to be much the stronger." Most American physicians can furnish confirmatory cases; and when the illness is plainly dependent upon malaria they intuitively prescribe quinine, not as an antiphlogistic, but as antagonistic to the real cause of the disorder. There are other causes than malaria, but they principally depend upon nervous influence as their medium of operation. One of the most common in healthy climates is the alternate exposure to heat and cold, and particularly to severe chill of the abdomen, as by clothing wet with perspiration. Among exceptional cases proving the rule is that reported by Duckworth¹ of a woman who was sinking with uncontrollable dysenteric diarrhoea ensuing upon an operation for strangulated femoral hernia. The shock of the condition, or of the operation, seems to have expended itself in that way. She was cured, after the failure of the usual remedies, by enemata of ipecacuanha. It is simpler to conceive of a depressed or partly paralyzed nervous group after and as the result of such a condition, than to presume in it a blood-poison especially affecting the intestinal glands. Indeed, from the earliest clinical observations facts concerning some forms of bowel affections have been recorded whose reasonable explanation requires the intervention of the nervous system. A plausible reading of one of the disputed passages of Hippocrates,² *Πορνείη ἄχρωμος δυσεντερίης ἄχος*, is consonant with Aristotle's³ expression: *Διὰ τί τὰ*

¹ *St. Barth. Hosp. Rep.*, vii., p. 117.

² *Epidem.*,* vii., sec. 134.

³ *Προβλήματα*,* xviii., sec. 4.

ἀφροδίσια τὴν τοιλίαν φύχει καὶ ξηραίνει; and these are confirmed by Aëtius,¹ *Alvi profluvia invetera aliquando per Venerem resiccantur*, Paulus Ægineta,² *Alvi profluvium inveteratum Venus resiccat*, and others. Reason declines to describe these results, attained by acts whose essence is an intense nervous action, as the probable elimination of a blood-poison or the direct suppression of an inflammation.

The hepatic complications are a frequent stumbling-block, for it has often been insisted that they belong to, if they do not sometimes cause, the dysentery itself, especially in very hot climates. Foreign residents in the tropics often suffer from diseased livers, and it is yet common to charge that organ with many of the true dysenteric lesions. But the frequent independence of, at least, hepatic abscess and dysentery is admitted by the later writers, which the statistics³ of the Florida War confirm for this country. I do not at all deny the coexistence of hepatic lesions with long-continued dysentery, but it seems to me that they both may be due to a pathological condition back of the local manifestations. For further observations on this point, attention is invited to the section on acute hepatitis.

V. The Particular Therapeutic Operations of Ipecacuanha.

It will now be assumed for the purpose of argument that ipecacuanha is a nervous stimulant, acting chiefly through the sympathetic system.

It may be objected that this begs the question: but it does so only for the time and for convenience of discussion. If this hypothesis does not account for the phenomena, the proposition fails. If it does explain them satisfactorily and better than any other, it may be accepted as a theory and the question is then not begged but the proposition becomes the simple statement of a fact.

a. In Dysentery.—I have explained what I mean by nervous depression and stimulation and have set forth a theory of dysentery. If those premises are entirely correct, the conclusion is inevitable that ipecacuanha is a nervous stimulant; for there are a myriad of unimpeachable witnesses, of almost every nation under heaven, who will

¹ Tet.* I., ser. iii., cap. 8.

² *De Re Medicâ*,* lib. i., cap. 35.

³ *Medical Statistics U. S. Army*, 1839-1854, pp. 647, 655, 689.

testify to its control of that disease. But while admitting that it does control dysentery, all, so far as I know, refer the facts to some other hypothesis; none publicly acknowledge that it has a stimulant or tonic virtue, except in minute doses; and a very large class, especially in this country, on theoretical grounds deny that it has any peculiar influence in that disease. It is therefore proper to build up the argument as to its action, not only in dysentery but also in the other diseases reported.

The neurotic influence of remedies, of which opium, ergot, and quinine are well-known types, daily receives clearer professional recognition. Ipecacuanha by common consent belongs to that general class, so we are not called upon to reëstablish that fact but merely to decide the direction of its force. Does it diminish the nervous tone, does it lessen vitality, does it weaken the powers of those organs that are supplied by the nerves that it influences, and does it render them less capable of discharging their functions? When from other causes the system is depressed and the vital powers are failing, does it deepen the depression and suppress the effort to rally? To my mind the clinical record that is a part of this work, irrespective of the mass of corroborative testimony elsewhere, is an irresistible negative. Whatever ipecacuanha did it certainly made no worse Cases V., VIII., XIV., XVI., XXIV., XXVI., XLIII., XLIV., XLVI., XLVIII., LVII., LX., LXVI., LXXII., LXXXIV., to which attention is recalled with the request that they may be read anew in this connection. Some of these were critically ill, but practically no other medicine than ipecacuanha was employed in them. Allowing for the accidental and inexplicable recoveries that sometimes happen, it is incredible that so many coincidental escapes from its depressing influence, if it has such, could have occurred: nay, more, it must be that it is directly curative.

To determine how it may be curative, let us analyze a few typical cases. Cases II., VIII., XIV., XV., show immediate cures of severe sporadic dysentery taken in its early stage. The sharp pain at once subsides. Generally speaking pain is an index of depressed nervous power, as, for example, the headaches and neuralgias of exhaustion. We are sometimes misled in medical thinking, as well as in other logical studies, by the use of terms that involve secondary ideas, that themselves are figures of speech. It is customary to speak

of soothing pain, of soothing into quietness the violent and irritated condition. But that is a figure, evidently born of the common experience of soothing or tranquillizing by persuasion an angry, irritated temper; which, in turn, is itself frequently stimulation, supplying some deficient motive. If pain indicates nervous depression, its relief means elevation to the normal tone; and it is no objection to say that anæsthetics, and other agents that directly change or overpower the nervous susceptibility, also relieve pain. They suspend the painful condition, but if the cause is not meantime removed the pain recurs upon their withdrawal.

The slimy, mucous and bloody discharges bear no resemblance to those of health, and are manifestly characteristics of disease. How are they induced? Roughly speaking, glandular secretions occur in proportion to the blood visiting the gland. If the sympathetic is moderately depressed, besides the pain that may naturally be expected, it is reasonable to suppose that with relaxed vaso-motor control the blood will begin to stagnate, as it were, in and near the glands of the colon, their secretion modified in quality and quantity will increase, and, either by capillary rupture or by actual exudation, blood will find its way into the canal of the bowel and the deranged sensation, culminating in tenesmus, will seek relief in frequent attempts at evacuation. All these conditions, then, which are the essential phenomena of dysentery, may depend upon insufficient nervous action. If the nervous tone is reëstablished the tormina disappear, the capillaries are braced up, the mucous glands respond to their appropriate stimulus, the secretions resume their normal character and amount, and the tenesmus subsides.

The opium sometimes given with the ipecacuanha is occasionally credited with the cure. But it is small in amount and it entirely fails when depended upon alone, and, as in Cases IV., XVIII., XIX., as well as in others not detailed, the effect of the ipecacuanha is not diminished by its omission. To the repose that is generally enforced some ascribe much of the good effect. Rest is a valuable means of husbanding nervous energy, especially when it is already scanty. But most severe cases of dysentery are compelled to seek repose, and that repose by itself is not curative. Undoubtedly mitigation of symptoms often follows rest, but that may fairly be interpreted as simply cutting off a source of nervous drain; and that the medicine may act effect-

ually without it Case IX. illustrates. So the fluid stool that frequently follows is sometimes called moderate catharsis, and to it is attributed the favorable action. Without opening up the question of the action of cathartics, it appears sufficient to suppose that the painless dejections of varying consistence are the normal results of intestinal action when the nervous influence is no longer deranged. It is a sufficient answer to the revulsive and antiperistaltic explanation that G. B. Wood offers, to point to the prompt and complete cures that occur without emesis or even without nausea. Diaphoresis generally occurs as the disease yields, and it was upon the establishment of this condition that Moseley¹ so much insisted nearly a hundred years ago. To say that the diaphoresis cures the dysentery in the instance of ipecacuanha, is to interchange effects. If diaphoresis is established it certainly is an indication that the cutaneous circulation is more active and, in the same degree, the intestinal vessels are relieved. I know of no other way by which ipecacuanha excites perspiration than by its action upon the skin and sudoriparous glands through the nervous system. The perspiration as such does not cure the dysentery, but it is rather the sign that the nervous equilibrium has been reestablished and the bowels are relieved from their local pressure.

Is there any reasonable explanation for the utter and immediate abolition of the earlier morbid symptoms if they are the signs of an inflammation? Or, admitting the nervous action of the medicine, could a nerve-depressant relieve the griping pain, the pathological discharges, and the feeling of weakness that make up dysentery? But, as has been remarked in another connection, if this process is allowed to go on unchecked, it will certainly and rapidly degenerate into an inflammatory state that will persist and become aggravated as long as the original depression remains. But that even in advanced stages of the acute disorder this medicine offers a reasonable hope of relief Case XVI. is a clear example, and others may easily be found, especially in Indian reports. Mr. Docker's² original paper contains several such among the severe tropical cases that he there details, and the only fatal one among more than fifty on which his report is based confirms the view here taken. In that instance the man had been ill three weeks before reporting sick: "The evacuations, which were excess-

¹ *Op. cit.*, pp. 172-176.

² *Lancet*, Am. reprint, Oct., 1858, p. 253.

ively frequent, consisted entirely of sanies, and large coagula of pure blood, without a particle of feculent matter. The man, in short, appeared to be in a dying state."

Four days later, when he had taken two ounces of ipecacuanha, the stools became perfectly natural, and not a trace of blood or mucus was afterward seen. Two days afterward he died from abscesses involving nearly the whole of the liver. "Post mortem examination demonstrated how prompt had been the action of the medicine in the complete cessation of ulcerative, and substitution of reparative, action. The lining membrane of the large intestine in its entire course was covered with recent ulcers of enormous size—in some places, indeed, so large as to occupy the circumference of the gut. The whole had begun to cicatrize; their edges were even, surfaces smooth and covered with a fine epithelium; all thickening of the coats had disappeared. The bowel contained natural semi-fluid fæces; no vestige of mucus, pus or blood."

Mr. Docker, to whom the world owes very much for this most useful publication, says¹ as to its mode of action: "As regards the *rationale* of the action of ipecacuanha in large doses, I will not venture on so debatable a point to express an opinion. That it is a very energetic *tonic* is sufficiently evident; equally certain that it is a most powerful *styptic*, (this being the effect of its tonic property,) and as such likely to be of great use in some active and in most passive hæmorrhages, especially in those occasioned by exudation from mucous surfaces." This explanation has been strangely overlooked by writers on the subject; and it may not be improper for me to say that when I reached a similar conclusion, as published in the original report² of which this is an amplification, I had not seen Mr. Docker's own article nor had heard of his just-quoted views.

It is obvious that this theory of the stimulant action of ipecacuanha explains the cure of such cases as Duckworth's, induced by the shock of a surgical operation, (p. 90 *ante*,) and many of those dysenteries and diarrhœas that occur from neighboring irritation, such as mesenteric tubercles, abdominal injuries and the like. And it offers a clue to the want of uniform success in those cases of phthisical diarrhœa where the lower bowel is itself the seat of direct tuberculous ulceration, although it

¹ p. 258.

² *Atlanta Med. & Surg. Jour.*, xiii., 2d May, 1875, p. 80.

might control the diarrhœa that reflex action sets up from adjacent tuberculous deposits and glandular enlargements. It cures dysenteric ulcerations by removing their causes, but the causes of tuberculous ulcerations are essentially different. It likewise accounts so obviously for the relief of much chronic dysentery that it would be superfluous to recapitulate the particulars. And it renders unavailing the complaint of Mr. Leach (p. 32 *ante*) as to the effect of a few grains of ipecacuanha upon so many square inches of ulcerated surface.

b. In some Painful Intestinal Affections.—It requires no elaborate argument to demonstrate that the good effects of ipecacuanha in the cases of painful intestinal affections, as recited on pages 34–38, may be readily accounted for by the stimulant property with which we have invested it. Where there is an evident physical cause, such as indigestible food, its removal will often suffice; but when due to conditions that probably are not of such a nature, the restoration of the nervous tone is often all that is required. This is well shown in the two instances of rectal pain in the advanced stages of typhoid fever (Cases XXXIII. and XXXIV.). The series of cases XXIX. to XLII. inclusive has no common bond except the abdominal suffering, which in every instance may be regarded as dependent upon nervous depression.

c. In Cholera Morbus and Cholera Infantum.—As already stated, I first used large non-emetic doses of ipecacuanha in cholera morbus experimentally and as the next direct and logical step after testing its efficacy in severe abdominal pain not complicated with dysentery. In the few but severe cases where I so employed it it was perfectly effectual, and Mr. Higginbottom's experience fully warrants the practice on a large scale. It is to be borne in mind that my own use of it there in large doses was essentially non-emetic; and although Mr. Higginbottom sought and obtained emesis, there is no record that by that operation anything was discharged that could be looked upon as having caused or kept up the mischief. That gentleman indeed seems to look upon the vomiting as, if not the actual reason, at least the index or sign of its effectual action. More than twenty years after reporting the cases just referred to, Mr. Higginbottom, in 1868, read before the British Medical Association a paper upon "Ipecacuanha in Emetic Doses as a Stimulant, Restorative, Eliminative and Adjuvant, in various cases of Disorder and Disease." I have not been

able to consult the original memoir, but it is thus somewhat vaguely epitomized:¹ "The author inferred that the interests and advancement of the profession could not fail to be greatly promoted by a long, careful, and practical investigation of a single therapeutic agent. He was of opinion that emetics were much less used than formerly. Ipecacuanha, besides its specific properties as an emetic, expectorant, and diaphoretic, has other valuable properties which he believed had not been particularly noticed by the profession. He had constantly, for more than half a century, administered ipecacuanha in English cholera, fevers, erysipelas, neuralgia, periodical drunkenness, uterine hæmorrhage, complaints in old age, syncope, senilis, etc. The main efficacy of ipecacuanha is in stimulating and restoring the normal action of the capillary system." Although the notion of necessary emesis is very manifest in this abstract, the last sentence contains the kernel of his fifty years' experience—"its main efficacy is in stimulating and restoring the normal action of the capillary system."

Cholera morbus and cholera infantum by common consent are not disorders requiring sedative treatment. No practical physician would attempt to further depress a patient approaching or in the collapsed condition that marks their course. But to avoid repetition and for the sake of compactness, a sketch of their pathology will be deferred until the probable efficacy of ipecacuanha in cholera is discussed; and the matter is now laid aside with simple reference to the empirical fact that these diseases of depression have unquestionably yielded to this medicine. The French use of it by the rectum in children probably arises from the constant employment in that country of the decoction, a form that so frequently induces vomiting; and from the desirability of keeping the stomach in condition for the introduction of food. The experience of M. Chouppe, already referred to, may be consulted very profitably.

d. In Hæmorrhages.—The hæmorrhages in which ipecacuanha has proved most useful experimentally are those known as passive, and a passive hæmorrhage, indicating a loss of power either local or general, is frequently most serious. Speaking generally, we find that the blood escapes in such cases simply because the vessels no longer receive or no longer respond to the stimulus of contraction. The most appalling

¹ *Brit. Med. Jour.*, 22d Aug., 1868; *Ranking's Abst.*, xlviii., p. 92.

of these is from the uterus, and it is there that this medicine has best exhibited its wonderful power. Post-partum hæmorrhage almost invariably arises from atony, and it is the atony that is to be overcome. It is the recognition of this that makes professional teachers, who are imbued with the traditional notions of its action, so wary of recommending it for such an object. Thus H. C. Wood,¹ after saying "it is at present very seldom used" as a hæmostatic—never within his personal knowledge—adds, as if in surprise, "it has been even given, with asserted advantage, to arrest flooding after childbirth." In this terrible accident there is no time delicately to graduate the size of the dose, or to carefully insist upon the precautions against emesis. Consequently, vomiting usually occurs synchronously with the cessation of the flow, and to the vomiting is generally attributed the cure. That both conditions are effects is an equally plausible explanation, for the vomiting need only be regarded as indicating the physiological action of the drug. Truly, active vomiting may be very useful to induce uterine contraction. Indeed Duckworth² states that Mr. Higginbottom reports a case of flooding "at once checked by the vomiting induced from the irritation of the fauces by a feather," and I believe that in the East a ball of the woman's hair is sometimes thrust into her throat to accomplish the same object. The marked and sudden pressure of the mechanical stimulus of active vomiting may excite the flaccid organ upon whose want of tone the mischief depends. But the vomiting of exhaustion is a frequent concomitant in these cases, and the muscular contractions in the abdomen after the use of ipecacuanha are slight compared with those following the severer emetics; and it is improbable that in Dr. Read's cases, XLVIII., XLIX., for example, the moderate excitement of the emetic, as such, roused the nearly exhausted woman, who had not responded to the vigorous treatment previously employed. Tyler Smith's opinion as to its supra-emetic nervous action in connection with puerperal hæmorrhage we have already (p. 44) quoted.

But as it is also of service in those hæmorrhagic states, such as ordinary menorrhagia, where there can be no necessity nor opportunity for the characteristic cramping of the womb itself, its true hæmostatic quality must, further, be additional to its emetic and to its musculo-

¹ *Therap.*, 2d ed., p. 412.

² *St. Barth. Hosp. Rep.*, vii., p. 122.

contractile powers. Trousseau¹ frankly admits that its anti-hæmorrhagic function is inexplicable in the light of the ordinary therapeutical teaching, and he does not attempt to elucidate it. G. B. Wood,² on the other hand, believes it has no hæmostatic effect other "than such as may depend on the depressed state of the pulse attendant on the state of nausea." It is only necessary to place this by the side of Mr. Trenor's³ record (p. 44), where in non-emetic doses it arrested hæmorrhage and restored "life and heat to patients who were in a state of collapse from excessive loss of blood," to expose its weakness. That patients can be rescued from the depths of exhaustion by virtue of a further depression is a step beyond the sublime in medical logic. The various cases recited and the conditions of the circulation described in the earlier part of this work are unintelligible on any depressant theory of the action of ipecacuanha. And speaking of the contra-indications for emetics, Stillé⁴ says: "Undoubtedly they should be cautiously employed in all cases of imminent hæmorrhage from any organ * * ; but the absolute objection to them sometimes inculcated, appears to be based upon theoretical rather than practical grounds; for it does not appear that ipecacuanha, at least, has ever been charged with any disasters of the nature referred to * * ."

But all the speculative objections fade away in the light of the hypothesis here propounded. The woman, gasping and tossing as the vital force streams out with the flowing blood, requires no further depression. Her necessity is to have the remaining nervous force utilized, to have it aroused and excited so as to seal the bleeding pores. That can only be accomplished through the action of the vaso-motor nerves, which are so acutely responsive to the sympathetic. Admit the stimulant action of the drug and it is at once seen how, either by direct or by reflex action, the vaso-motors resume their control and, when necessary, the sluggish womb responds to its further spur and normally contracts. Manifestly ipecacuanha cannot supply the blood that is lost, but it interposes a barrier, it erects a coffer-dam, behind which nature may carry on its work of restoration.

The clinical history of ipecacuanha in the hæmorrhages adds cumulative evidence to that of the choleraic cases in antagonism to the depressant idea of its office.

¹ *Loc. cit.*

³ *Dublin Jour.*,* xviii., p. 481.

² *Therapeutics*, 1st ed., ii., p. 447.

⁴ 1st ed., ii., p. 441.

I am tempted to introduce at this point a suggestion which, although not perfectly apposite, bears indirectly upon our theme. Dr. Wilson Fox,¹ treating of hæmorrhage from the stomach, writes to this effect: In some of the capillary hæmorrhages which arise from congestion, "there is probably, in addition to the congestion, some alteration in the coats of the capillaries * *." "In the same manner are probably produced the hemorrhages of yellow fever, and of other [?] malignant intermittents, as also those which occur in relapsing fever, typhus fever, cholera, purpura, scurvy and hemorrhagic variola. In other cases though probably referable to the same source its mode of origin is less explicable; as when it follows severe surgical operations or blows upon the back or epigastrium, or even a remarkable case reported by Empis where the invasion of tubercular meningitis was associated with uncontrollable vomiting with hæmatemesis." It appears to me that a profound ganglionic derangement is an essential factor in all these conditions. The alterations in the blood that may occur in some of the diseases named are of course to be reckoned, but the want of nervous power is probably an important element, and to my mind is a rational explanation of the "less explicable" cases noted. The hæmorrhages following surgical operations or blows upon the epigastrium bring these cases in direct relation, as to cause, with the dysentery following an operation for hernia, already referred to.

e. In Excessive Perspiration.—The remarkable influence of the nervous system through the emotions upon the secretion of perspiration, to which Flint² refers, is too well recognized to require discussion. That the influence may be propagated through the sympathetic, he illustrates by Bernard's experiments, where the skin on a horse's neck was abundantly covered with sweat when the sympathetic supplying that region was divided, and the secretion was arrested by galvanizing the divided nerve. Flint³ also cites in corroboration Mitchell's⁴ and Bartholow's⁵ cases of unilateral sweating of the head after injury of the sympathetic. In this connection see particularly a valuable paper by W. Pepper.⁶ Professor Ebstein⁷ reports a case of paroxysmal sweating accompanying angina pectoris which he attributes to a demon-

¹ *Diseases of the Stomach*, 3d ed., Phila., 1875, pp. 248-9.

² *Phys.*, iii., p. 138.

⁴ *Injuries of the Nerves*,* 1872, p. 318.

⁶ *Phila. Med. Times*, i., pp. 170-3.

³ *Op. cit.*, iv., p. 440.

⁵ *Jour. Psych. Med.*,* 1869, iii., p. 134.

⁷ *Virchow's Archiv*,* Jan., 1875.

strable microscopic lesion of the cervical ganglia, whereby transient paralysis of the vessels supplied by their nerves was caused by temporary pressure from the impeded venous flow.¹ The explanation is satisfactory, and directly implicates the sympathetic. It may be assumed, then, that directly or, more generally, by reflex action, the vaso-motors are concerned in its production, and this whether the perspiration is normal or pathological.

Normal perspiration, occurring under the influence of exercise, for instance, is an active function due to the stimulation of the additional blood sent to the skin through the increased circulation. Pathological perspiration, on the other hand, may be called passive and be attributed to the atony, in greater or less degree, of the smaller vessels, and, when extreme, as in collapse, may be the consequence of a fair paralytic leakage.²

It is less easy to explain the normal diaphoresis that often follows the use of ipecacuanha, than its power of checking the excessive discharge. H. C. Wood,³ while classing it among the nauseating diaphoretics, says it "seems to exert an influence upon the skin, even independently of its action on the stomach." If an explanation must be made, I should fall back on the equilibrium hypothesis and presume that the medicine disturbed the healthful balance by exciting some other element of the nervous system and thus relaxing the tension of the vaso-motors. The exact and minute distribution and control of the nervous filaments in the sudorific glands is, however, confessedly too obscure to warrant an authoritative or positive assertion upon the point.

But the empirical fact of the tonic influence in hyperidrosis is established, and to attribute that to its direct nervous stimulation is an explanation agreeing with its other restorative functions. As already noted, Chouppe, puzzled to account for the phenomenon which he fully admits, refers it to the vaso-motors but offers no explanation of the mode. Polichronie, also admitting the facts, suggests a revulsive intestinal action, of which I do not know any clinical evidence; or, that, by the elimination of the drug through the sudoriparous glands, their secretion is dried up, which also, so far as I know, is

¹ *Med. Times and Gaz.*, 27th Mar., 1875, p. 344.

² H. C. Wood, *Therap.*, 2d ed., p. 486.

³ *Op. cit.*, p. 489.

unproved, and, to me, is unintelligible. But, reasoning *a posteriori*, analogy completely sustains the view of the sthenic action of ipecacuanha; for ergot, an admitted vaso-motor stimulant or astringent, is a valuable remedy in this condition; and atropia, looked upon by many as such an excitant, fulfils the same office.¹ The greatest weight that this explanation carries comes from the fact that it completely coincides with other known properties of the medicine as herein set forth, and that this use might have been made of it on *a priori* grounds.

f. In some forms of Dyspepsia.—Because in the preceding sections attention has been specially directed to the vaso-motor nerves, we are not to forget that their control, so far as ipecacuanha is concerned, is probably a reflex derivation from the sympathetic, and that it is not especially upon them but upon the nervous system as a whole, and particularly upon the organic branch of it, that we suppose this medicine to act. When, then, we find it admitted that in small doses ipecacuanha is a tonic to digestion, the formal teachers are in accord with this conception of its power.

Daubenton² was careful to state that the cases where it is useful are where digestion is slow, where the food lies heavy on the stomach and there is an inability for mental or bodily exertion for some time after meals, and he believed that it owes its efficacy in such cases to its exciting peristaltic action in the stomach and imparting energy to its glands. Dr. Budd³ wisely observes that it is clearly impossible that any medicine having a definite mode of action, whether it be to increase or to restrain secretion, can be used successfully in stomach disorders without the cases are properly selected—a plea against its abuse, as in the earlier days of its employment. He classes the action of ipecacuanha with that of rhubarb, ginger, and pepper. G. B. Wood⁴ describes it as a tonic, increasing the appetite and facilitating digestion, when swallowed in very minute doses. Ringer⁵ thinks it excites the secretion of mucus independently of its nauseant or emetic action and thus becomes slightly purgative, and he says “it is stated” that constipation depending on intestinal torpor and the dyspepsia of constipation may be relieved by grain doses every morning fasting. Wilson Fox⁶ asserts that

¹ H. C. Wood, *op. cit.*, pp. 242, 249, 522.

³ pp. 233–4.

⁵ *Op. cit.*, pp. 392, 397.

² Budd, *op. cit.*, p. 233.

⁴ *Therap.*, 2d ed., p. 444.

⁶ *Op. cit.*, p. 21.

Corvisart found ipecacuanha to produce great increase of the mucous secretion. It does not appear in what quantities he used it. These uses are those that would be required in atony, in dyspepsia from deficient nerve supply, and it is obvious that the mode of relief is by a direct impulse or stimulus. The digestive function is so confessedly under nervous control that it is unnecessary to do more than thus advert to the matter.

Some of the views in the remaining subdivisions of this section may jar even more severely upon professional prejudices than those already submitted. Most of them are provisional, and, although set forth in good faith, may be discarded if not sustained by examination and experience. New truths always seem strange, but the novelty of a proposition is not an argument either for or against its probability. The reader is begged to candidly examine the matter from the writer's point of view as well as from his own.

g. In Nervous Vomiting, as that of Pregnancy.—To avoid confusion, the term nervous vomiting instead of sympathetic, or reflex, is used in this connection to designate that act when it does not arise from some material change in the stomach itself, or from something introduced into that organ. In these cases it is a symptom, but it is often so exaggerated as to be graver than the original affection, of which, indeed, it is occasionally the only apparent sign.

The common explanation for many of these cases is, that they are due to the transmission of irritation through sympathy¹; or, as Cazeaux² accounts for the nausea of pregnancy when a positive mechanical cause cannot be discerned, "to the numerous sympathies existing between the uterus and the stomach" although their intimate nature "is very obscure." The phrase "irritation" is another misleading figure of speech, carrying with it an idea of at least partial stimulation, of excess of vital action, instead of that of disquietude or disturbance, which would better represent the facts. As we shall see later, many topical irritants are positive depressants. This confusion frequently obscures the appreciation of this species of vomiting. But as nausea or vomiting may follow a blow over the solar plexus, the

¹ Da Costa, *Medical Diagnosis*, 2d ed., p. 396.

² *Midwifery*, 4th Am. fr. 6th Fr. ed., p. 273.

painful compression of the testicles or ovaries, an abdominal wound, the agony of nephritic or biliary calculi, all, when analyzed, conditions of nervous depression, so it will be found that other so-called irritations, which indeed may be irritations in the sense of perturbations, are states of drain upon, or lowering of tone of, the nervous system. Just as diarrhoea sometimes is caused by fear, may nausea or vomiting be induced by mental emotion, and the reason in both cases is similar.

Now, we can readily understand that, as in some instances that will occur to the reader, there is a general nervous depression, an asthenia, of which this is the sign, or, as in others, there is a mal-distribution of the nervous force, depriving the stomach of its normal supply. Such, for example, is a plausible explanation of the nausea of pregnancy. The high vitalization of the growing uterus and its important contents concentrates upon that organ an extraordinary amount of nervous energy, leaving the stomach an inadequate supply. That the condition we are discussing, whatever may be the immediate method of its production, is a sign of, at least, local nervous depression, the vertigo, syncope and derangements of the special senses and intellectual faculties that are common in pregnancy, and that must be looked upon as lowered, not exalted, nervous states are supporting indications. The vomitings that are directly traceable to dependence upon ulcerations of the os, or to undue rigidity of the cervix, are easily embraced in this hypothesis of disturbance. Why these dyspepsias, for the vomiting of pregnancy may be classed as a temporary dyspepsia, should be exceptions to the rule that the inefficient performance of a function is a sign of weakness, I do not comprehend. Admitting it to be a weakness, whether the particular hypothesis here advanced to account for it be accepted or not, it follows that the corrective influence of ipecacuanha proves its stimulant action.

In corroboration of the character of these vomitings and of the line of relief, attention is invited to a series of eighteen unselected cases of this general description reported by Dr. F. D. Lente.¹ The stimulus of electricity promptly cured all of them. A comparison of the two sets of cases will establish their pathological analogy, and, as Dr. Lente's agent is unquestionably stimulant, it follows that the action of ipecacuanha is similar in its bearing.

¹ Beard's *Archives of Electrology and Neurology*, Nov., 1874.

h. In Asthma and Nervous Coughs.—Asthma is confessedly one of the least understood of the neuroses, obscure as they are as a class. It is generally regarded as essentially a spasmodic constriction of the smaller tubes, preventing the free passage of air through the pulmonary tissue. The agents removing that condition are spoken of as depressants, although all writers admit that some that are notoriously stimulant, as coffee, spirits and certain emotions, frequently accomplish the same end. Dr. Thorowgood¹ makes the point that, while the condition is one of spasm, it may be either inspiratory or expiratory, that the function of the lung may be suspended during expansion as well as during contraction.

The asthma is essentially an arrest of function, and I see no impossibility in conceiving that it may occur from a deficiency of nerve-power as well as from its excessive development. The patient in a paroxysm is in a condition of partial carbonic acid narcosis, which he attempts to overcome by violently using the auxiliary voluntary respiratory muscles, thus presenting an appearance of quasi-excitement; but the real status that brings about this perturbation can as well be accounted for by the directly reverse hypothesis as by that of tonicity. I can well imagine that a debilitated or partly exhausted nerve may fairly give out and leave the lung in this impotent state. The usefulness of the tobacco-collapse and of the anæsthesia of chloroform, however, militates against the notion of depression being the constant pathological sign, but “the successful application of galvanism in the treatment of habitual asthma” by Dr. A. P. Wilson Philip, shows that that is sometimes the condition.² Unfortunately, there is so much that our science does not embrace, so much that we do not know, that we cannot rationally explain the disease and its treatment in all their parts. If compelled to offer an hypothesis, I would present the notion of a forced nervous equilibrium, not that of health but rather that as of locked athletes, where, by the antagonism of forces, a calm or state of coerced inaction has been produced, upon overturning which by a sufficiently powerful agent, either stimulant or depressant, nature is permitted to resume its normal course. But at the best this is only an hypothesis that with our present information we cannot prove. As

¹ *Med. Times & Gaz.*, No. 1229, 17th Jan., 1874, p. 63.

² Joseph Jones, *Med. & Surg. Mem.*, i., p. 85.

it is fairly shown by competent authority that either sedatives or stimulants may relieve a paroxysm, I should be willing to regard the essential nature of asthma a drawn question, and trust a determination of the action of ipecacuanha to the weight of other testimony. But if the advocates of the depressant idea decline this offer and press that view, it will become necessary for them to explain Akenside's¹ cure of the hysterical variety by its continuous use. Surely no one looks upon hysteria and its fruits as legitimate fields for lowering practice. It is possible that two distinct diseases are confused under the designation asthma. There may be a sthenic idiopathic variety; there are certainly many examples of the asthenic reflex form, as, for instance, from uterine,² gastric and emotional causes, and these, if the views here promulgated are correct, indicate diminished rather than increased nervous power. For as sometimes uterine irregularities give rise to vomiting, so may they at other times to hiccough,³ to neuralgias, to epilepsies and to asthma. And in like manner with the other original sources.

It requires but a slight change of conditions to put the nervous coughs as a class on the same basis as the nervous vomitings already discussed. We do not know why the morbid influence should at one time draw upon the pulmonary and at another upon the gastric apparatus, but we can easily believe that it is so—especially when we find the same curative agent influencing both conditions.

i. In Delirium Tremens.—It is no part of my purpose to add another knot to the tangled discussion of the action of alcohol, and I therefore pass over everything until the practical question of the treatment of delirium tremens is reached.

Some later writers on mania a potu set it aside in the limbo of self-limited diseases, from which after a certain degree of expiatory penance the patient will emerge rehabilitated. The doctrine of morbid self-limitation, while useful in checking meddlesome and mischievous medication, may do much evil when it ties the hands of the physician, or, at best, transforms him into an umpire whose only province is to prevent the interference of extraneous forces in the contest between the vital

¹ *Trans. Lond. Col. Phys.*,* i., p. 93.

² *Practitioner*,* Dec., 1875; *Phila. Med. Times*, No. 213, 22d Jan., 1876, p. 213.

³ *Phila. Med. Times*, No. 215, 19th Feb., 1876, p. 244.

and azoic powers. The cases cited in the earlier pages of this work establish delirium tremens as susceptible of direct cure. The disease is essentially an asthenia, and the cerebral vagaries, the "busy delirium," no more denote a real increase of action than do the jactitations of the hæmorrhagic patient mean an elevation of general physical vitality. As the heart flies on with an ineffectual and uncertain, though greatly accelerated motion, so does the nervous system and especially the brain, exhausted, stagger in purposeless wanderings along a tortuous way. Both require the strong support of a nerve tonic. Digitalis in large doses certainly supplies the one—I believe that ipecacuanha affords the other, and confidently point to the limited but satisfactory clinical record of Dr. Schenck in confirmation. It is especially gratifying to find that so eminent an authority as Anstie¹ pins his faith to quinine as the best nervous tonic in this disease; for, as the clinical record shows, there are other pathological conditions where quinine and ipecacuanha may be interchangeable remedies. Then why not in this?

j. In Opium Poisoning.—Although, at least so far as published American experience has extended, the question suggested in the earlier part of this work by the Italian notion of the antagonism between opium and ipecacuanha has never been tested, there are some curious points involved that tempt one to linger a little over them.

The Italian idea is that opium is solely a stimulant: but there is every reason to suppose that, whatever may be the effect of small doses, the narcotism of opium poisoning is essentially a depression—it certainly involves paralysis of the voluntary and, in the later stages, of the involuntary muscles. Section of both pneumogastrics will bring down the respirations from sixteen or eighteen to four a minute,² thus closely imitating by this paralysis one of the characteristics of that condition. In poisonous doses opium produces intense cerebral congestion; a slow, full pulse, due to its action upon the inhibitory cardiac nerves; a depressant action upon the intra-cardiac ganglia, causing the final cessation of the heart's action; possibly vaso-motor depression; and death generally results from the failure of respiration, due to its direct influence upon the respiratory centres and to the consequent carbonic acid

¹ Reynolds's *System*, ii., p. 87.

² Flint, *Phys.*, iv., p. 235.

narcosis.¹ It will immediately be objected that ipecacuanha cannot be supposed to relieve this state, because there is no evidence that it possesses properties that antagonize these conditions. But before pronouncing it impossible, some admitted facts may be examined. Atropia is recognized as a valuable agent in overcoming the opium mischief. Now what is the action of atropia? Death from it, due to asphyxia from paralysis of the trunkal nerve-functions, follows stupor after delirium; or it may occur from syncope, by failure of the heart-muscle, to which it is a direct depressant. But it is useful in opium poisoning chiefly by stimulating the respiratory centres and, in a degree, the accelerator nerves of the heart.² In other words, atropia, capable by itself of causing death, and that by congestion and paralysis, is by no means a symmetrical antagonist to opium, but preserves life by supporting one leg of the vital tripod until nature recovers itself. Electricity, flagellation, the cold douche, general nervous stimulation, by no means equivalents of atropia, are also efficient counter-agents. Now, at least until it is proven to the contrary, we may suppose that the influence that quiets by invigorating, not paralyzing, the aching abdominal nerves in colic, that relieves the pain and empties the surcharged capillaries in dysentery, that compels the flaccid and torpid uterus to contract, and that so frequently overpowers the malarial poison, may be a nervous agent of some strength, and if it is such, that it may aid in the toxic state under discussion. I do not indeed affirm that it does possess this anti-narcotic property—but that has been asserted by parties deemed worthy of notice by Stillé, as quoted. And these suggestions are thrown out to contravene the objection that such action is impossible. According to the common view it is as incredible, *a priori*, that ipecacuanha will check hæmorrhage as that it will dispel narcosis; but we know that it will do the one, and if we endow it with a general nervous stimulant power it is, abstractly speaking, as likely to embrace as to fail of the latter attribute.

k. In Neuralgia.—To set forth that the diseases embraced under the general term neuralgia are manifestations of depression would be supererogatory. To maintain that these protean forms spring from identical germs would be absurd. And to attempt to explain why manifestations of the same general character are so various would be

¹ H. C. Wood, 2d ed., pp. 205–225.

² *Ibid.*, pp. 242, 243, 251.

equally unwise. The few cases that I have noted where the pain subsided under the use of ipecacuanha may be mere coincidences, but I do not think they were. More probably they were malarial neuralgias, and the influence of this medicine over that condition is elsewhere touched upon. But the cases may have a value as a nucleus around which greater and more valuable statistics may cluster. But in collecting these it is especially important that they should be properly selected. The attempt to relieve by ipecacuanha neuralgias due to the mechanical pressure of a foreign body, to the persistent influence of syphilis, to organic changes in the nerve fibre, or to many other constantly operating causes, would probably fail. But such blunders should bring no discredit upon the medicine. They would only reflect upon the injudiciousness of the physician who might persist in that practice after the failure of the tentative measures that we are always authorized to employ in the interest of progress.

But before leaving this topic I present a triple reference that may serve as food for reflection and, as I hope, offer a point for practice. Anstie¹ lays stress upon erysipelas as a complication of, or a condition correlative with, facial neuralgia. Now Waring,² without giving the reference, says: "In erysipelas M. Vidal strongly advises the use of ipecacuanha. He states that he has seen it arrest the disease even where the cerebral symptoms had become very decided." But it is well known that quinine in large doses is excellent treatment for erysipelas, and it is proven in the antecedent pages that in practice quinine and ipecacuanha are often interchangeable. The deduction is probable, though not incontrovertible, that in much idiopathic neuralgia ipecacuanha would prove restorative and that in erysipelas it would be curative.

l. As an Antiperiodic.—It is generally conceded that the malarial poison expends its main force upon the nervous system, and common consent styles it a depressant. Probably following the nervous aberration, are various deviations from health in other tissues; such as alterations in the blood itself, (although, indeed, it is not clear whether the lesions of the blood may not partly depend directly upon the toxic agent,) congestions of the internal organs and arrest of or change in the function of some of them. When the attack is severe the nervous

¹ Reynolds's *System*, ii., p. 737.

² *Op. cit.*, p. 392.

system seems simply overpowered and profound coma or furious delirium, each a sign of vital depression, follows. Many of these malarial diseases are marked by the curious and inexplicable phenomena of periodicity, which gives its name to a class; and the remedies that cure them are styled antiperiodic, without there being any indication that they peculiarly destroy that characteristic except so far as they abolish the whole malady.

The exact nature of malaria has baffled investigation, but, notwithstanding the most delicate chemical tests and manipulations have hitherto failed to isolate it, it is commonly assumed to be material. It is not necessary for the comprehension of the therapeutical problem under discussion to dispute this assumption, but I venture upon an etiological episode (which may be omitted bodily without interfering with the integrity or vitiating the argument of this paper) to suggest that this poison may be accounted for as an imponderable force developed by organic decomposition. There are certain analogous conditions whose reality is undisputed, that may be drawn upon for illustration. Thus, solar light, beyond its agency in vision, is not only necessary to preserve the health of the body, but in the cure of disease plays an important although at present unexplained part as an active nervous tonic. May there not be an immaterial though active agent, as yet unappreciated and undetected except through its effects, that, working for evil, directly perverts or paralyzes nervous action? We recognize electricity as an available tonic generated under certain conditions of metallic decomposition. Why may not malaria be an atonic force developed under certain conditions of vegetable decomposition? And as the imponderable stimulant electricity directly alleviates certain pathological states, as, for example, that following the poisoning from lead, so, conversely, there is nothing illogical or impossible in the conception of the asomatous depressant malaria being antagonized by the absorption of somatic agents. It will be objected, however, that malaria must be material because: it may be transported considerable distances laterally and vertically; but electricity is conducted and light and heat act through space under favorable conditions: it may be arrested by forests and other vegetable growths (although it is not clear whether this occurs mechanically or from its absorption by them); but light, heat, motion and electricity are all arrested by appropriate obstacles: it may be absorbed by water and become active after its

ingestion (although this is beginning to be questioned by the later writers¹); but electricity may be "condensed" and retained for considerable periods in Leyden jars and other insulated receptacles, and finally be actively discharged. It may be further objected that the supposition of a force instead of a material is opposed to the analogies of pathology, and that such an influence must be presumed to chiefly act by contact, which would be unique; and, still further, that it is unphilosophical to multiply causes. But light, the remarkable influence of some of whose rays we are only beginning to learn, almost certainly acts by impact, and so does therapeutic electricity; there is thus nothing impossible in the supposition, while the circumstances that the light-haired, blue-eyed blondes of the North succumb first² to this agent, whatever it may be, and the negro in proportion to his blackness resists it, suggest that the character of the general surface of the body may (not necessarily must) influence the susceptibility. May it not also happen that the protective power of woollens resides in their physical or mechanical attributes, as well as in the uniform temperature that they secure? It will, however, be still further objected that to admit this hypothesis requires its extension so as to embrace all diseases where specific germs cannot be physically demonstrated. The logical offspring of facts are always adequately cared for in the economy of nature; it is only their spurious and putative progeny that make mischief. This hypothesis does not require us to go beyond our assigned limit and contend with other difficulties. Other diseases may be left to care for themselves. But there is, really, a large class of diseases the moral evidence of whose material causes is clear enough to compel credence. And the multiplication of causes is not unphilosophical when it represents at the same time their intelligent subdivision. The same argument would defeat the differentiation of diseases that is going on so actively. On the same ground should be opposed the distinction between the varieties of croup, between typhoid and typhus fevers, between scarlatina and measles, and, in general, the erection into a separate family of the so-called zymotic group.

But the practical question, regardless of the exact nature of the

¹ Hertz, Ziemssen's *Cyclop.*, Am. ed., ii., p. 586.

² Hertz, *op. cit.*, p. 577.

morbific agent, is, how do the antiperiodics—in this instance how does ipecacuanha—act?

The operation of quinine, the best known and the type of the whole, is still undetermined. Whether it actually supplies a material that the malaria has destroyed, as Bence Jones's experiments on animal fluorescence would indicate; whether by controlling the heat-centres it prevents the development of fever; or by its direct influence upon the tissues hinders their rapid decomposition, and so checks the evolution of heat; or literally neutralizes the malarial influence however expended, as an acid acts on an alkali, is foreign to our present purpose. A good authority¹ believes that in the present state of our knowledge it is "perfectly futile to endeavor to explain why it averts a paroxysm of intermittent." We might in like manner dispose of the antiperiodic influence of ipecacuanha, by appealing to experience for the end and ignoring the means. But there is clinical evidence that, while not solving the enigma, throws a light upon some of the details.

Before referring to that evidence, I reproduce from a report by the late Dr. B. M. Byrne,² U. S. Army, these pertinent sentences upon the generic influence of quinine, which seem to have good ground under them: "All that is known respecting the primary effects of this medicine [quinine] is that it is capable of making a powerful impression on the nervous system." "Its impression must of course be specifically different from that of all other agents; and if it be expedient to designate it by any particular name none can be so expressive as the term *quinine impression*." "It appears probable that the remedial agency of this medicine depends on the *counter* impression which it makes on the nervous system, and especially on the ganglionic portion of it." "We have strong reasons for believing that it is principally on the ganglionic system of nerves that miasmatic and pestilential poisons make their first impressions; and it is in accordance with a well-established medical axiom to infer that an agent which can produce a powerful *counter* impression on the same system of nerves may thereby modify or control the morbid effects of those poisons." These prove nothing, but they are the clear and connected

¹ H. C. Wood, *op. cit.*, p. 72.

² *Medical Statistics U. S. A.*, 1839-1855, pp. 657-8.

expression of distinct ideas—which may be equally applicable to ipecacuanha.

Let us now briefly recapitulate some recognized points in the pathology of malarial poisoning, and then apply to them such apparent powers as we may believe ipecacuanha possesses. In intermittents: anæmia occurs, from direct change in the blood; the general heat-generating power is impaired; the spleen and liver are congested and the gall-bladder is filled with thick bile; there is hyperæmia of the stomach and duodenum; frequently no lesions of the nervous system can be detected after death, but the symptoms are such that they must be those of depression; while the stagnation of the blood and the profound internal congestions, the local variations of temperature, the extreme sweats, all mean great vaso-motor disturbances. In other words, the essential nature of malarial poisoning is profound functional depression of the cerebro-spinal and, especially, the sympathetic system. Remittent differs from intermittent chiefly in degree. These views are so generally admitted that it can hardly be necessary to formally cite sustaining authorities.

Analyzing these facts *seriatim*, the anæmia is first to be considered. Their *débris* having been found in the spleen, has given color to the supposition that it is a function of that organ to disintegrate the red blood-corpuscles. Similar facts, by parity of reasoning, place similar duty upon the liver. But it is sufficient to suppose that, broken down in the general current of the blood, the fragments are swept into these receptacles by the flood of local congestions and are left there stranded at the subsequent ebb. That no special organ is necessary, either for their creation or destruction, Flint¹ is sustained in presuming by these circumstances: that in the ovum they originate by genesis in the sanguineous blastema, before the existence of special organs for their formation or disintegration; that they are regularly organized anatomical elements, subject to the same general laws of molecular waste and repair as other tissues; and that when specially reduced by hæmorrhage, or otherwise, they seem to be formed *de novo* as, primarily, in the fœtus. It strains nothing to suppose it quite as probable that their condition, as well as that of the whole circulating fluid, largely depends upon the integrity of the nervous functions, as it is with other ana-

¹ *Physiology*, i., p. 120.

tomical elements. It is impossible to say that the malaria does *not* directly disorganize the blood by a corporeal action upon the corpuscles, but recognizing its general nervous effects, it is more consistent to trace all its consequences to the same root. That the nervous system in a degree directly affects nutrition, the blanching of the hair by fear and the complete alteration of the milk by passion indicate. The heat-making power and the congestion of the spleen and liver confessedly follow nervous alterations. The hepatic condition will be specially discussed under another heading. For the control of the capillary congestions and the extreme sweats, which are important conditions in the malarial fevers, we may fairly invoke that faculty of ipecacuanha, whatever it may be, that makes it valuable in hæmorrhages, in dysentery, and in other hyperidroses. If it tones the minute vessels in those morbid conditions, why should it not so operate in this? Or, if where it does control intermittent, as the reported cases show, the capillary equilibrium is restored in some other way, how does it act in the dysenteries and hæmorrhages? To this an incidental probable corroboration is found in the practice of Dr. Duboué, as noted by H. C. Wood,¹ who employs ergot in intermittents; for we have already noticed a strong therapeutical likeness in some of the properties of ergot and ipecacuanha. On similar grounds ergot is recognized as an anti-dysenteric remedy. The same alternative is presented in the matter of the general nervous depression that exists in this disease, as well as, in a modified form, in the dyspepsias, nervous vomitings, and coughs that already have been discussed. If it stimulates in those manifestations of local depression, why should it not stimulate in intermittents? But if it cures them by its sedative action, as some may maintain, why should it not be particularly injurious, instead of, as it has been experimentally found, remedial in the agues?

Closely connected with the mode of cure must be studied the etiology of intermittent in relation to that of the most serious variety of dysentery, and the one in which its power is best shown, in order to fully realize the possible influence of ipecacuanha in other malarial attacks. The positive statements of Aitken have been already quoted. Maclean,² recognizing their common origin, says: "In the present state of knowledge it is not possible to explain why malaria should in

¹ *Op. cit.*, p. 524.

² Reynolds's *System*, i., p. 53.

one case cause dysentery, and act with intensity on the glandular structures and mucous membrane of the great intestine, and in another excite an intermittent or remittent fever * * ." A medical writer¹ upon the British Ashantee war of 1874 says: "The malarial poison has in this expedition almost invariably given rise to either remittent or intermittent fever or dysentery—sometimes to more than one of these. Thus it has been no uncommon thing for a soldier or sailor to be sent to hospital for remittent—if such a name could be given to the malady—and after a time to suffer either from intermittent or dysentery." Partly as additional evidence but chiefly from its associated interest, I introduce these extracts from Robert Jackson's interesting but now rare *Treatise on the Fevers of Jamaica with some observations on the Intermitting Fever of America*.² In discussing Intermittent Fever as he observed it among the British troops (71st) with which he served in the Revolution, he speaks of an intermittent prevailing among them on York [Manhattan] Island in the summer of 1778: "In the month of July, a dysentery of a very particular kind, became epidemic, and the sporadic intermittent instantly vanished." "It disappeared totally about the beginning of August, or rather changed into an epidemic intermittent." In August, 1779, he was at Beaufort [S. C.] and again met with intermittent where "it often degenerated into dysentery or dropsy." In the next autumn, 1780, in campaign in South Carolina, he observes: "Indeed the intermittent, the dysentery, and even the dropsical swellings so often alternated with one another as evidently shewed that they all depended upon the same general cause." He continually notes the same condition in his command, which formed part of the army capitulating at Yorktown, October, 1781, until after that event. There are many other references to the interchange of these diseases. He asserts:³ "The intermitting fever of America shewed a strong disposition to change into a species of dysentery." "The changes from intermitting fever to dysentery, and from dysentery to intermitting fever, were so frequent in the months of August and September that those diseases seemed evidently to depend upon the same general cause; assuming at different times the one or the other form from causes which we could

¹ *Med. Times and Gaz.*, 11th Apr., 1874, pp. 405-6.

² Philadelphia, pp. 191-203.

³ pp. 215-6.

seldom ascertain." Similar incidents are to be met with in that region to this day. Any one who has seen much of these diseases will admit their frequent coëxistence or substitution, as, in fact, several of the original cases reported illustrate. It certainly seems probable that pathological states acknowledging a single cause may yield to similar remedies, and that those remedies should act in the same general manner in each instance.

Flowing from this and from other hypotheses advanced, is the probability that in the malarial hæmaturia of the South ipecacuanha may be useful.

m. Its Febrifuge Action.—The anti-pyretic, in distinction from the antiperiodic, action of ipecacuanha is not sufficiently made out to warrant much theoretical discussion. A little space may be devoted, however, to some of the later views of fever. According to these the elevation of temperature is the essence of the fever and produces the circulatory and general nervous disturbances.¹ This elevation is due to increased heat-production by increased systemic chemical action, which, in turn, is under special nervous control. And the anti-pyretic action of quinine is supposed to follow its stimulation of the inhibitory chemical centre. I fail to see the force of the argument that attributes "diminished heat-production as well as increased heat-evolution" ("evolution" seems here used by Dr. Wood not in the sense of development but of dispersion) to vaso-motor paralysis.² Certainly local elevation of temperature follows an increased amount of blood in a part, which is one of the results of this paralysis. And, by similar reasoning, the constringency of dilated vessels compels less heat-production. Any local inflammation that is relieved by topical bleeding, or by astringents, illustrates the point. As heat may be produced by friction, by chemical action, by electricity, in the inorganic world, why should we be required to limit it to one nervous manifestation in the animal kingdom? Why may it not be produced at least by local excess of blood and by direct changes in the tissues from increased excretion and altered secretion as well as by other nervous irregularities? In other words, may not fever occur from other causes than disturbances of the heat-centres alone? But apart from the decrease of temperature following the use of ipecacuanha in cases

¹ H. C. Wood, *Toner Lecture IV., Fever*, 1875, p. 1.

² *Op. cit.*, p. 24.

XLII., XLIV., LXXXII., which I should, in great measure, assign to its vaso-motor control, the analogy of its action to that of quinine in intermittents leads to the presumption that this drug, like that, may possess a further but not yet understood special febrifuge quality.

n. In Pneumonia.—From the absence of clinical facts of my own and the unanticipated length to which this essay has grown, I omit a lengthened argument upon this point. But for the consideration of the younger men, who may be disposed to look at it with the candor of students and not pass it over as a fanciful analogy unworthy a professional paper, I offer the suggestion whether there is not a strong family likeness in much of the etiology, the nervous distribution involved, the initial lesions and the treatment occasionally employed, making allowance for the difference of function in the parts affected, between pneumonia and dysentery? If there is, the deduction is obvious.

A clue to this relation may be found: (1) In the admitted connection of malaria with the frequent causation of each. (2) In its essential nature. It may shock the prejudices of those who look upon pneumonia as the type of an inflammation to suggest that, as in dysentery, the true inflammatory state is a consequence of, but is not the original disease. This distinction may be derided as a mere verbal one: but it is more than that; it represents essentially distinct pathological states, steps having a necessary sequence perhaps, but of very different signification. One of the most acute and felicitous of modern physicians¹ has said that in the incipient stage of pneumonia "we must look to the vaso-motor nerves as bearing the first shock of the morbid impulse which determines the whole course of subsequent events;" and he finds² "this stage of congestion is fairly divisible into two periods; the first an intra-vascular hyperæmia disturbing the tissues till they yield; then secondly, an exosmose or exudation results, a true hæmal infiltration." This, to my eye, is perfectly parallel with the course of dysentery. Further, Juergensen³ ably maintains that: "Croupous pneumonia is a constitutional disease, and is not dependent upon a local cause. The pulmonary inflammation is merely a chief symptom, and the morbid phenomena are not due to the local affection."

¹ Dickson, *Studies in Pathology and Therapeutics*, p. 122.

² p. 123.

³ Ziemssen's *Cyclopædia*, Am. ed., v., p. 144.

"The outbreak, or more properly the development of the pneumonia, may be hastened by * * exposure, but there is no other connection. Fright may bring on labor in a pregnant woman, but it ought not to be held responsible for her pregnancy." I would interpret that to mean that, like dysentery, it is a local manifestation of a nervous poison—but why it is exhibited at one time in the pulmonary and at another in the intestinal tissue does not yet appear. The intermittent pneumonias of malarious regions afford apt illustrations of this principle. In them during "the chill and the hot stage the patients are seized with dyspnœa, they cough much, without expectoration, and complain of the most violent pain in the breast. The pulse soon becomes full, rust-colored sputa appear, dulness on percussion and increased vocal fremitus are manifest, while auscultation reveals at first crepitant ronchi, then bronchial breathing and bronchophony. During the sweating stage a decided remission of the fever takes place, as well as an abatement of the symptoms, subjective and objective, which may almost entirely disappear during the intermission that follows"¹ to be renewed in like manner in a quotidian or tertian paroxysm. The clinical history of the South is full of such cases. It is the fashion to call these intermittent fevers and not pneumonias, because they do intermit and are cured by quinine. But there are just as graphic and precise accounts of intermittent dysentery,² which every one's experience in such districts confirms. These are more usually admitted to be dysentery, but they also are sometimes defined as intermittent fevers. Now the intermittent pneumonias, while they exist, present every symptom of the ordinary pneumonia with the feature of periodicity engrafted upon them. This periodicity does not deprive them of their true pathological character—it is an accidental and not an essential condition. (3) In the use of quinine, which is universally employed at the South as a powerful adjuvant to, if not itself the chief element of, the treatment, and in the use of ipecacuanha itself. This, besides its frequent vague and routine use as an "expectorant," has occasionally been relied on as the main remedy. Thus Delioux³ using it by the Brazilian method, (in conjunction, however, with depletion and vesication,) found that "it subdued the pulse, excited

¹ Hertz, *op. cit.*, i., p. 612.

² *Loc. cit. sup.*, p. 610.

³ *Bull. de Thérap.*,* xli., p. 152.

perspiration, deprived the sputa of their bloody hue, and hastened the resolution of the disease;" and Dickson,¹ who regards pneumonia as a disease of "destructive and fatal character," having long ago abandoned antimonials, writes: "In their stead, I have employed in large doses, and, as I thought, with excellent effect, ipecacuanha, with or without opium." It does not appear what he looks upon as large doses. Here are certainly suggestive indications for the curious student.

o. In the Puerperal State.—Reliable witnesses have testified that ipecacuanha is valuable in the complications of child-bed, and we have examined specific examples of its power over *post-partum* hæmorrhage. Now, what is the condition of the puerperal woman? The muscles, striated and involuntary, are fatigued, the nervous force is exhausted, the general and local circulations are unbalanced and deranged and especially lack the vital and mechanical stimulus and support to which they have been accustomed, and there is a state of shock, varying with the susceptibility of the patient and the suffering that has been endured. There is an obvious tendency to local congestions and to reactionary conditions, and the rest insisted upon by the wise obstetrician aids nature in regaining its strength, but affords only a passive resistance to morbid processes. Obviously what is further required when disease threatens is not a depressant or revulsive agent, but one that will invigorate the nervous system and will so brace the finer circulatory apparatus as to equalize the supply and distribution of blood. It is by such an influence that I conceive ipecacuanha to have wrought its "charm" in Trousseau's hands. The indications are apparent enough, and if the results are attained in so magical a manner it is only logical to assume that the indications have been fulfilled.

It will, however, be objected that true puerperal fever, in which also it has been claimed as of value, is a septicæmic disease akin to pyæmia and to erysipelas. It is not contended that ipecacuanha or any other known drug directly destroys the hæmic poison, the ferment that is sometimes assumed. But if, as has been acutely suggested, there are granted "fever-centres," it is unnecessary to suppose that the poisoned blood acts as a fever generator upon all the tissues that it touches, but that it is merely a common carrier of the toxic principle, transporting a direct poison to the appropriate nervous knot, and that

¹ *Op. cit. sup.*, p. 142.

in strictness, even pyæmia or the exanthemata may not be hæmic but are neurotic diseases.¹ On, however, the ordinary theory of puerperal fever, there is required for its development a special condition, the *nidus* created by child-bearing. Now just in proportion as that is rendered unsuitable will its intensity be diminished; and it is thus that the constringent and general tonic power of this medicine may be presumed to be beneficial. The possible direct influence of ipecacuanha over erysipelas may be borne in mind in connection with the reciprocity between the two diseases.

p. In Acute Hepatitis.—Professor Maclean believes the action of ipecacuanha in hepatitis to be the same in mode as he regards it in dysentery, that is as a blood-depurant and evacuant. I confess to not fully understanding how it might so control that disease, nor do I see the necessity for looking for “its direct action on the secreting function of the liver,” in a specific sense, as implied by Dr. Begbie.² It is with extreme diffidence that I venture the expression of an opinion upon this point, and I certainly should make no suggestion were it not common justice that one rejecting a view should offer something to replace it. But, unfortunately, it is far easier to recognize than to disentangle a complication.

The first stage of suppurative inflammation of the liver is one “of hyperæmia, of turgescence, circumscribed or diffuse as the case may be.”³ Now, whence the hyperæmia? Normally the parenchyma of the liver is flooded with blood, the supply to the organ as a whole being regulated by the state of the general circulation. But the local intra-hepatic distribution manifestly depends upon local conditions. Is it more reasonable to suppose that the blood circulating throughout the entire body would only manifest disease in the liver if that fluid itself were at fault, or that the nervous system, which largely regulates its special distribution in other circumscribed localities, exercises that power there also? I do not pretend to demonstrate the exact mode of this presumed action, but merely to indicate its probable existence. The liver is abundantly furnished with nerves, both of sympathetic and cerebro-spinal origin. That they influence its special bile-making functions, the well-authenticated causation of jaundice by fear is inci-

¹ H. C. Wood, *Toner Lecture IV.*, p. 12. ² Reynolds's *System*, iii., p. 149.

³ Maclean, Reynolds's *System*, iii., p. 325.

dental proof. There is nothing exceptional in supposing that in the liver, as elsewhere, a deranged nerve-force may locally or generally disturb the amount and quality of the blood-supply and initiate those changes that culminate in abscess. And if this be true, it follows that while these nervous irregularities exist so long will the tendency to disease continue, and the morbid process be supported in its progress. An hypothesis of this kind accounts for the abscesses that often insidiously form in the victims of malarial cachexia without exhibiting the phenomena of general inflammation.

The first step to cure will not be the diminution of the gross amount of blood by venesection, nor the alteration of its quality by mercurials, as Indian experience has practically and abundantly demonstrated, but in restoring the proper nervous power.

q. As an Antidote to Venom.—This is not sufficiently well established to warrant much theoretical discussion. To suppose that whatever power it exerts is in the direction of nervous stimulation, would not be out of accord with the general treatment of snake-bite nor with the presumed action of ipecacuanha in disease.

r. Its Topical Effect.—Its influence over such affections as conjunctivitis appears to depend upon its faculty of cutting off the morbid vascularity, through the local vaso-constrictor action that follows its absorption.

VI. The Stimulant Action of Ipecacuanha.

I can draw but a single inference from the facts and opinions scattered through the preceding pages. The material will combine for me in but one generalization—that ipecacuanha is an anti-depressant. Omitting the debatable sections of this paper, I feel that satisfactory evidence has been presented of the value of ipecacuanha in dysentery, in some of the choleraic forms of intestinal disease, in nervous vomitings, in passive hæmorrhages and in intermittent fever. No one will seriously maintain that the indications in these diseases are for depression, and no violence is done to any known physiological or pathological fact in supposing that each of these morbid states may acknowledge a loss of nervous control as its efficient pathological cause. It must follow that the restorative agent is a counter-depressant, is a stimulant.

VII. Possible Objections.

But the scientific therapist may insist upon physiological demonstration, and the practical physician, for whom mainly this essay has been written, will object that ipecacuanha is made to fulfil too many indications, and by a natural skepticism will reject the whole.

a. As to Physiological Experiments.—I frankly admit writing from a pathological, instead of a physiological, or a toxicological, position. I have made no experiments upon the healthy subject, nor have I attempted to demonstrate with the instruments of science the consequences of overdoses in the lower animals. There is a value in such experiments properly conducted, but they have within themselves many sources of error: additionally to possible inaccuracy of work, aberrations from condition and fallacies of observation are to be avoided, for the most careful operators frequently arrive at conflicting conclusions. A training to which I have no claim only can insure correctness. But besides the mechanical obstacles and the graver one of possible variations of constitution and of susceptibility in the lower animals, is the much more serious difficulty of attempting to draw inferences as to disease from what may happen in health. The premises differ so fundamentally that the deductions cannot be convertible. Our constant experience insists that the well and the ill are unlike. The sick man is literally an invalid, he is unsound, and he does not respond as in health to the influences that may be brought to bear. When out of tune, the most melodious instrument will be discordant under the finest touch. Occasionally connections may be traced, but too often health and disease are utterly dissimilar. They are conditions of the same force, but the unlikeness constitutes practical inequality. The physical properties of ice, water and steam are not more diverse than those of the system in disease as contrasted with health. And this not merely superficially, but as tested by treatment. An inflamed prostate responds promptly to ergot, under which the normal gland is impassive. Alcohol that would intoxicate or would kill, or opium that would narcotize in health, is taken up with benefit in disease. So, for experiments upon the lower animals to have a therapeutic value, pathological states corresponding to those of disease should first be induced. For the science of practical therapeutics is built up by the careful observations of the effects of medicines in

disease and by thoughtful inferences as to their further effects in similar (not identical) conditions, and not by speculations based upon their actions in radically different states. Every fact has its place in the chain of truth, but to understand their relation the mind must examine it link by link.

b. As to its Action in Diverse Diseases.—The barrier to the acquiescence of the practical physician will be the multiplicity of indications that seem claimed for improbable attributes of a familiar drug. He will object, justly, that the superstition of universal remedies has been laid; or, that to admit the essence of dysentery, of cholera morbus, and of ague, each, to be a nervous depression and each in turn to be relieved by the same drug, is to acknowledge them one disease, at which his common sense revolts. The *non-sequitur* here is the same as it would be to regard the prismatic colors identical because they spring from the same source and may be obliterated by the same agency. But their non-identity does not disprove their association. There are few drugs whose remedial manifestations are confined to a solitary pathological indication or are expressed by any specific formula. It is in this very province, the action of medicines, that there is the least accurate knowledge. However, just as many diseases are simply modified operations of one normal office or function, is it fairly to be inferred that a single remedy may exhibit various powers. Even the so-called specific, quinine, has other attributes than simple antiperiodicity, and these come into operation as necessities require. We are justified in supposing that it is thus with ipecacuanha. As a specific it may be an emetic, but it has other gifts. Final analysis may ultimately determine that the same drug always exerts the same kind of influence; but the conditions under which it is exercised so fluctuate that we are authorized in calling the modified manifestations different virtues, in the same sense that we speak of different, although co-derivative, diseases. The therapeutical action of a particular medicine may be compared to constant pressure exerted in a given direction. Then just in proportion to the degree of resistance, that is to the nature of the morbid influence, will be the amount and character of the force required or of the result attained. As, for instance, heat is a constant force that, according to circumstances, melts lead, vaporizes water, consumes wood, expands a column of mercury, or reddens a bar of iron. Heat is the constant factor, and by its intensity and the nature of the resistance to be overcome we attain the seemingly

diverse results of liquefaction, vaporization, combustion, expansion, colorification and the like. But the invariable agent is the same, and the ultimate result is the same: we can always foresee that end, but not always the route by which it is attained. It is, therefore, no bar to the theory of the invariably stimulant action of ipecacuanha that it displays that power in various ways; nor need we refrain from speaking of its anti-dysenteric, anti-hæmorrhagic and other therapeutical properties because, strictly, they all may be comprehended under a single faculty.

VIII. Cautions.

I may be allowed to offer a few words of caution, learned by experience.

Occasionally it is contended thus: Admit ipecacuanha to be a stimulant and it is out of place in a dysentery characterized by bloody discharges, by acute pain, by a dry skin and by fever—by the signs of inflammation. I believe that it has been fairly shown that these symptoms in dysentery are the signs of vital depression; but the high temperature—the fever—is a specious condition sometimes leading to vicious reasoning. Excessive heat does not necessarily denote increased vitality. No one decries stimulation in typhoid fever, where, usually, the higher the temperature the more is it in request; and the post mortem rise in cholera is the *reductio ad absurdum* in the argument that measures vital action and the necessity for lowering treatment by the thermometrical register. This may seem a superfluous explanation, but the objection is occasionally made and I feel sure that it has an unconscious but positive influence over much practice.

Ipecacuanha has so close a popular association with necessary emesis, and vomiting is so frequently excited by mental influence, that it may be necessary to entirely conceal from the patient the name of the medicine. A lady to whom a physician prescribed the wine in single drops, found it impossible to retain it at all. It was then changed to pills of the powder and the name was concealed. These she took regularly without inconvenience until the name was again divulged, when she at once vomited uncontrollably.

And care must be observed that the medicine is pure. So excellent an authority as Dr. E. R. Squibb, of Brooklyn, informs me, under date of 11th November, 1874, that: "There is very much ipecac.

now in the market that is of very doubtful character. It is a large size root, produced in the West Indies, is cheap, and is used either as a substitute or adulterant of the true Rio ipecac. Perhaps half the powdered ipecac. sold may be made from this variety."

IX. Concluding Observations.

The position that this paper, which, in the most literal sense, had its origin in an attempt to explain the phenomena occurring in routine work, seeks to fill, is simply an illustration of the not commonly appreciated qualities of ipecacuanha for the use of practical physicians. It is not a special plea for that drug to the exclusion of others; it does not present it as a substitute for quinine, for ergot, or for any other valuable remedy now in use. It is an endeavor to increase, not to diminish, the materia medica. In like manner there has been no attempt to expound the pathology or to discuss the treatment of any disease further than directly bears upon this medicine. Pathological states have been used only incidentally in its interest, and there has been no effort to influence practice except within this narrow limit. The questions of adjuvants and of modifications have been left untouched. I beg, therefore, that its scope may not be misunderstood.

I cannot leave this subject without a serious appeal for the trial of ipecacuanha in dysentery by those who may have hitherto ignored it. And I earnestly entreat all who may begin that practice to carefully adhere to the non-emetic method. Beyond doubt untold suffering has been endured during the past two centuries from the gradual abandonment of this wonderful remedy, after its triumphant introduction into Europe and before its recent revival in Asia—a disuse for which the disagreeable and unnecessary concomitant of vomiting is chiefly responsible. In practical medicine the least things are sometimes important.

PART III.

A SPECULATION UPON CHOLERA.

WHILE engaged in the earlier observations and in the reflections to which they gave rise, and being led up as it were by cases developing under my eyes, for Cases XXIX., XXX., XLIII., XLIV., occurred in consecutive order, to employ ipecacuanha in large non-emetic doses in cholera morbus, its possible usefulness in Asiatic cholera occurred to me. Aware that abstract reasoning not fortified by clinical experience at every step is seldom trustworthy in medicine, I have nevertheless felt it a duty, in view of no treatment having yet secured a fair degree of success, to expose the train of thought that leads to the supposition that this drug may prove useful in that disease. I do this with diffidence but not deprecating legitimate criticism, and with less reluctance because, at the worst, it will only add one innocent failure to the long list of unsuccessful trials, while it may develop the germ of cholera-control. To explain my opinion involves a recapitulation of the pathology of cholera and a rehearsal of some of the points already presented. And although I can justly claim the proposition as original, studies that it has opened have brought me upon indications, notably Dr. Waring's¹, which, though not identical, point in the same direction. I have not found any recommendation looking to its employment as a stimulant in cholera, although, in the vast unstudied literature of the subject there may be many, but such references to this medicine as I have discovered are faithfully recorded. I conceive that priority has little precedence over originality as a claim to credit, and that both are of small importance when compared with efficiency in the alleviation of disease.

¹ *Op. cit.*, p. 361.

It is not practicable even to enumerate here all the conceits that have been put forth to account for the phenomena of Asiatic cholera, but a brief notice may be taken of one advanced a few years since before more seriously discussing the probable explanation of the disease. The distinguished names of Dr. George Johnson and Sir Thomas Watson have given to the poison-to-be-eliminated hypothesis a certain foundation, and have drawn to it an attention that its abstract merits might not command. This hypothesis is, in brief, that the cholera phenomena result from the introduction of a specific poison into the blood, where it rapidly self-multiplies and spoils certain blood-constituents which are there ejected through the mucous membranes of the alimentary canal; that the poison circulating in the blood excites contraction of the muscular walls of the minute pulmonary arteries, arresting or diminishing the flow of blood in the lungs, which is the essential cause of the cholera collapse; that the copious discharges express nature's effort to throw off a noxious material, and really form, therefore, a necessary part of the process of recovery; and that if the pouring forth of the vascular excretion be checked (as it possibly may by opium), the risk of fatal collapse is thereby increased. They therefore advocate "the evacuant or cleansing practice," and propose not to excite increased excretion, but to facilitate the discharge from the mucous canal of matters already lodged there. Gentle elimination is the key-word. But this practice (except where abused by transformation into active purging) seems to be little more than abstention from active interference, and a trust that nature will effect a cure, as we know that it often does. Its greatest merit is that it leaves no room for and reprobates the opium and alcohol treatment, and it is actively good by its suppression of those mischievous agents. It appears, also, that unfortunate practical experience has aided theoretical reasoning to destroy the fabric.¹

All the other conceptions of cholera-treatment have rested on the supposition that the cholera-poison must be combated and its effects nullified within the system. They are diverse in nature but may be reduced in main outline to two: One, as expressed by McClellan,² is,

¹ Sedgwick, *Lancet*, Oct. 7th, Nov. 11th, 1871; *Am. Jour. Med. Sci.*, Jan., 1872, p. 252.

² *Cholera Epidemic of 1873*, p. 36.

"that it is an infectious disease resulting from an organic poison which, gaining entrance into the alimentary canal, acts primarily upon and destroys the intestinal epithelium." If, as the phraseology implies, this means that the destruction of the intestinal epithelium, which is generally admitted to occur in cholera, is the immediate result of the cholera-poison and is the essence of the disease itself, it would appear that an effect had been elevated into a cause. The shedding of the epithelium is a symptom common, in a modified degree, to other diseases, notably dysentery: but it is a consequence, not a cause, of the coëxisting nervous derangement. "The rice-water flux * * may occur also in other [than cholera] cases in which, as in cholera, there is a neuro-paralytic condition of the digestive canal."¹ But upon those who hold views materially differing from what the profession at large has settled upon, rests the burden of proof. That belief as to the nature and cause of cholera I think is fairly expressed in this summary by Professor Alonzo Clark,² viz.: "It may be stated that there is a poison the exact nature of which is not perfectly understood; that this poison introduced into the system causes disturbance of innervation or a sort of paralysis of the ganglionic nervous system; that this leads to extensive hyperæmia of the alimentary canal, resulting in the symptoms described, and to the reflex phenomena alluded to, [referring to the lecture from which this is taken,] and, as the disease progresses, obtaining more or less an inflammatory character." The interesting question of the infectiousness of cholera (which I believe should receive an affirmative answer) only concerns its propagation and not its cure, its preventive not its remedial treatment. Eliminate the question of the contagiousness of the excreta and there will be little dissent from the proposition just quoted from Dr. Clark.

It is generally admitted that the first, or the condition of painless diarrhœa, is the only stage of this disease in which therapeutics have hitherto availed; and there is fair reason to regard sulphuric acid, properly administered, as at least one remedy that is reliable in the control and perhaps in the prophylaxis of that condition. "Its action in cholera is explained thus: The contents of healthy bowels are naturally acid; but in true choleraic diarrhœa the alkaline serum of

¹ Sedgwick, *Lancet*, Dec., 1871, p. 644.

² *Med. Record*,² i., Nos. 2, 3, quoted by Burrall, *Asiatic Cholera*, p. 136.

the blood is poured out so copiously into the intestines as to render their contents no longer acid. Acids not only restore the natural acidity of the bowels, but cause the endosmotic current, which is always towards the alkaline side, to return to its proper course and thus reëstablish the function of absorption."¹

This watery diarrhœic condition, when not controlled, carries the patient into the second or cold and dangerous stage of cholera. Our knowledge of pathology, unfortunately, is too limited to explain exactly why the disease may sometimes be strangled, while at others it develops into a fiercer type. But there is no reason to suppose that the condition which culminates in collapse is more than the legitimate development of the unchecked morbid agent. To employ a rude material figure, it may be likened to the leak in a levee made by an insignificant shell-fish; but when the water pours through in a flood the crevasse itself is at once cause and effect, and must be cured by means so remote from the first simple but efficient remedy as to be virtually distinct in character.

The following is a fair *résumé* of the pathology of the second stage of cholera. Serous discharges, usually profuse, accompanied by painful cramps and culminating in collapse, is a comprehensive symptomatic description of it. Without attempting to describe all the pathological appearances, we find in the abdomen, which by common consent bears the brunt of the disease, that: the small intestine has a peculiar rosy appearance, its mucous membrane is finely injected and often shows extensive ecchymoses, and the contents of the bowel appear reddened with blood; the mucous membrane and whole intestinal wall are swollen and relaxed from œdematous infiltration; the glands are generally swollen and distended; the villi lose their epithelium; and, in brief, in the "height of the disease the characteristic changes consist chiefly in extensive catarrh of the intestines accompanied by detachment of the epithelium and copious transudation, in decided thickening of the blood, and excessive hyperæmia of the

¹ Peters, *Notes on Asiatic Cholera*, 2d. ed., 1867, p. 187. See also Stillé, *Therapeutics*, 3d ed., i., p. 282; Waring, *Therapeutics*, 2d Am. ed., p. 566; Curtin, *Phila. Med. Times*, iii., p. 649; H. C. Wood, *Therapeutics*, 1st ed., p. 83; M. W. Wood, *Med. Examiner*, [Chicago,] xiv., 15th Sept., 1873, p. 210; Woodworth, *Cholera Epidemic* 1873, p. 17; McClellan, *Ibid.*, p. 32.

kidney."¹ Mr. J. T. Gray,² indeed, on the authority of Drs. Lewis, Cunningham, Parkes and Goodeve, denies that there is any special loss of epithelium.

We cannot look upon one particular lesion as embracing the whole pathology of the disease, for the interdependence of the physical functions upon each other and upon various anatomical elements is well recognized as complete and complicated. But it is fairly understood that preponderating though not exclusive influences are exerted over different organs by individual and varied agents. One of the most clearly defined of these, anatomically and pathologically, is the distribution to, and control over the intestines by, the sympathetic nerve, and it is generally conceded that the essentials of the pathology of cholera are found in its profound disturbance, although all writers³ are not agreed as to the mode. An artificial derangement of the sympathetic is not cholera; but the most of the choleraic symptoms may be induced by its perturbation.

We may now briefly recapitulate certain points connected with the sympathetic. We find: intense hyperæmia of the mucous membrane of the stomach and intestines follows extirpation of the celiac plexus;⁴ and, presumably, a similar temporary condition would follow in proportion to the degree of its paralysis; Moreau showed by a series of experiments that, in isolating three loops of intestine in a fasting animal and dividing all the nerves passing to the middle loop, it was found next day filled with clear alkaline liquid, colorless or slightly opaline, while those with the nerves intact were empty and the mucous membrane was dry; Flint⁵ remarks, citing Moreau,⁶ that these "observations on the influence of the sympathetic nerves upon the secretion of liquid by the intestinal canal are peculiarly interesting in their

¹ Niemeyer, Am. fr. 8th Germ. ed., 1869, ii., pp. 648-9.

² *Med. Times & Gaz.*, Dec. 4th, 1875, p. 621.

³ See, among others, A. Clark, *op. cit. sup.*; Greenhow, cited in Burrall on *Asiatic Cholera*, 1866, p. 86; Marey, *Gaz. Heb.*,* Nov. 24th, Dec. 1st, 1865, quoted by Burrall, p. 137; Sedgwick, *Med.-chir. Trans.*, li., 1868, pp. 1-42; Jeaffreson, *Edin. Med. Jour.*, Dec., 1866, p. 520; Meigs and Pepper, *Diseases of Children*, 4th ed., p. 386; Pepper, *Phila. Med. Times*, i., p. 172; Sedgwick, *Lancet*, Dec., 1871, p. 644.

⁴ Flint, *Physiology*, iv., p. 433, citing Samuel, *Jour. de la Phys.*,* Paris, 1860, iii., p. 580.

⁵ *Phys.* iv., p. 434.

⁶ *Bul. de l'acad. imp. de méd.*, Paris, 1870, xxxv., p. 388.

bearing upon the sudden occurrence of watery diarrhœa" [and of cholera]; experiments of Peyrani "show that the sympathetic has a remarkable influence over the secretion of urine. * * When the sympathetic is divided the quantity of urine and urea sinks to the minimum."¹ A comparison of these demonstrable facts, with the recognized phenomena of cholera, sufficiently suggests without formal argument the part played by the organic nerve in this disease.

There is, however, other and cumulative evidence as to the fact and the nature of the implication of the sympathetic. But as its ganglia are not independent centres, it is likely that the spinal nerves are also included and, especially, that the pneumogastric is involved in the general nervous disturbance, for its branches to the small intestine are very numerous,² but exactly what part it plays has not been clearly made out.

The influence of the sympathetic upon perspiration, normal and pathological, has already been discussed. But, as Condie remarks, in cholera "this copious perspiration is generally not dwelt upon with sufficient emphasis, for it is a source of great exhaustion; it sets in early in the attack and becomes excessive towards the close of fatal cases,"³ and "the analogy between the watery diarrhœa of cholera and profuse sweating is remarkable"⁴ in character and mechanism. The rice-water flux, so often looked upon as pathognomonic, frequently occurs in similar but distinct affections. Dr. Jeaffreson,⁵ indeed, writing "On the Pathology of Cholera Collapse" asks, partly in criticism of Dr. Johnson's hypothesis, and partly in support of the idea that the intestinal irritation is the determining cause of the collapse, opposing the theory that it *follows* the nervous depression, "If this state [*i.e.*, the intense intestinal congestion of collapse] were produced by a special poison acting upon the nerve centres, even, which regulate the supply of blood in the arteries generally, how does it happen that the nerves and arteries of the intestines are either exempted from the peculiar influence or are acted upon in just the reverse manner; the small intestines (and in a less degree the large intestines) being the only portion of the body to which an active determination of blood has oc-

¹ Flint, iv., p. 434; fr. *Comptes rendus*,* Paris, lxx., p. 1300.

² Kollmann;* Flint, iv., p. 211.

³ Peters, *op. cit.*, p. 78.

⁴ J. T. Gray, *Med. Times & Gaz.*, Sept. 25th, 1875, p. 361.

⁵ *Edin. Med. Jour.*, 1866, xii., No. 1.

curred?"¹ This question finds a satisfactory answer in Flint's² words, where he discusses the experiments of Cyon on the depressor nerve: "We are sufficiently familiar with reflex paralyzing action upon the blood-vessels through the sympathetic system; and when we call to mind the immense extent of the abdominal vascular system we can readily understand how, if the resistance to the flow of blood be diminished by paralysis of the muscular coat of the small arteries, the pressure in the large arteries would be reduced." Or, in other words, to treat of the subject directly in hand, the intestinal capillary circulation is so immense that, when it is filled by the passive congestion that engorges it during the constrictor paralysis, there is no circulatory fluid worth mentioning remaining that could be actively determined to other parts. Dr. Jeaffreson in the same article thus describes the whole abnormal condition: "The chain of causation appears to be the following: A poison in the alimentary canal acts there as a direct irritant, causing more or less rapidly developed congestion and inflammation of the whole small intestine, to which much blood is determined. The intestine, meaning by the term the tissue of the various coats, becomes full and turgid, and acutely œdematous, whereby a strong rapidly-developed impression, resulting in shock, is made upon the innumerable and widely-spread branches of the sympathetic from the solar plexus by which the duodenum, jejunum and ileum are supplied." This is the expansion of the doctrine re-stated in the report on *The Cholera Epidemic of 1873*. The expression "'irritant,' 'irritating substance,' etc., in the bowels" seems to me another example of unfortunate medical metaphors. Irritation is generally looked upon as a spur, as something akin to stimulation; but as used here, and especially as used by Mr. Sedgwick, as about to be quoted, the facts would be better understood if described as "paralyzing," which is the state of the case as far as the nervous system is concerned. I do not understand that the nervous shock is necessarily or probably due, as just expressed, to the afflux of blood, but that the afflux follows the paralysis of the abdominal sympathetic from some other active toxic principle. Mr. Sedgwick, in a very valuable article, from which I quote liberally on account of the comparative inaccessibility of the original in this country, "On some Analogies of Cholera in which Suppression of Urine is

¹ p. 530.² iv., p. 232.

not accompanied by symptoms of Uræmic Poisoning",¹ very clearly shows that the ingestion of certain substances which might be presumed to cause blood-poisoning, such as decaying animal and vegetable matters, milk that has undergone some morbid change, various fungi, but also violent irritants, (*vide supra*,) as excessive doses of arsenic, nitric acid and other corrosive poisons, and, further, many severe accidents and incidents attending on disease, as wounds of the abdomen, and lacerations and perforations of the stomach and upper intestines, induce a collapse that in no essential respect can be distinguished from that of cholera. He says:² "There will not, however, be much difficulty in recognizing, on further inquiry, that whether the mischief be the result of perforation or of obstruction of the small intestine, the suppression of urine which results from it must be regarded chiefly as an indication of the intensity of the collapse, consequent on the comparative suddenness of the mischief, and its nearness to the abdominal centre of the sympathetic nervous system; in the same way that a corresponding suppression occurs in severe cases of cholera, while in mild cases of this disease, which it has been customary to refer to choleraic diarrhœa, there may be, and usually is, the characteristic flux without any suppression of urine." Among other contingencies in which the collapsed condition with urinary suppression occurs is intestinal obstruction, and it has generally been accounted for by the degree of peritoneal inflammation or the amount of vomiting. But Mr. Sedgwick points out³ "that any correlation which may exist between vomiting and suppression of urine in these cases appears to be simply the result of both conditions being primarily dependent on the affection of the abdominal nervous system." Attention is particularly invited to this opinion, as consonant with the original views already expressed in the earlier part of this paper. In reply to those authors who suppose "that the suppression of urine, if not the collapse itself, is essentially dependent in cases of cholera on the flux from the stomach and bowels," he asserts⁴ that "not only is there ample evidence derived from direct observation to refute it, in addition to the evidence which has been adduced from analogy, but that there is, moreover, a self-destructive fallacy in thus supposing that the digestive

¹ *Med.-chir. Trans.*, li., 1868, p. 1.

³ p. 34.

² p. 27.

⁴ p. 41.

canal could serve for the complete escape of excrementitious matter usually discharged by another outlet, whilst the elimination of excrementitious matter proper to the canal itself is completely checked. For just in the same way that jaundice results from the increasing accumulation of the essential elements of bile in the blood, and uræmic poisoning from the increasing accumulation of urea, so the absence of these two morbid conditions shows that during collapse there is no excess of excrementitious matter for either the kidneys or the liver to eliminate, and therefore no urine is conveyed to the bladder and no bile to the alimentary canal." We may well agree with Mr. Sedgwick¹ that "although analogy can only be referred to for the purpose of supplying indirect evidence, yet, on the present occasion, this is so strongly in favor of cholera being primarily due to an affection of the sympathetic nervous system developed through the medium of the digestive canal, as scarcely to need any further evidence to support it." And we may fully credit the assertion that he cites² from Dr. Davey, that "the fatal depression in cholera, consisting in the complete annihilation of the action of all the vital organs, may be at any time simulated by pressing the solar ganglion on the fore part of the bodies of the vertebræ over which it lies."

When death does not occur in the condition of collapse, a stage of reaction usually sets in. This is commonly admitted to be a febrile state that is to be treated on general principles, bearing in mind both the nervous prostration lately undergone and the possibility of reinducing it by want of care. Abrupt and complete recoveries occur however sufficiently frequently to demonstrate that the stage of collapse cannot be one of true inflammation, as is sometimes contended.

This recapitulation of the pathology of cholera, containing nothing that is original, and nothing that has not been published before, may seem superfluous; but it has been compiled and made a part of this paper for convenience of reference.

The present state of medical science does not permit us to generalize nor even to frame a plausible hypothesis upon the correlation of diseases, except in a very limited and doubtful degree. But neither does it allow us to look upon them as isolated foreign entities that

¹ p. 42.

² p. 43.

may be implanted or plucked out of the human system as integers. There is often an undeniable blending, and the distinction between members of many well-marked groups is frequently one that implies affinity as well as diversity. Thus erysipelas and puerperal fever, diphtheria and scarlet fever, are examples of such rudimentary consanguineous grouping. There are collections of symptoms, fusing with more or less completeness, connecting pathological classes that in appearance are quite distinct.

Now cholera is *sui generis* only in the peculiarity of its reproductive power. Professor Stillé¹ in a comprehensive lecture on this disease asks: "In what does sporadic cholera differ from malignant cholera?" and answers, "only in its cause and its degree. Its mechanism is the same;" and that the epidemic "differs from the sporadic form chiefly by the intensity of its cause, the gravity of its symptoms and the nature of the special cause that produces it." Dr. Da Costa² reports a case of sporadic cholera with intestinal lesions found at the autopsy identical with those of epidemic cholera, although in life the discharges were not similar nor were there cramps. Dr. W. Alston³ publishes a striking case of sporadic disease parallel in all particulars, except its origin, with the epidemic form. Meigs and Pepper⁴ make a strong argument for the practical identity, saving the feature of self-propagation, of cholera infantum with the epidemic disease. Polichronie⁵ writing of the different forms of diarrhœa in children, speaks of "*le choléra infantile, qu'il est souvent presque impossible de distinguer du véritable choléra asiatique.*" As already quoted, "the rice-water flux * * may occur also in other cases in which, as in cholera, there is a neuro-paralytic condition of the digestive canal;" and the numerous cases cited by Mr. Sedgwick in his Analogy show one or another pathological phase of the pestilence duplicated in some other affection.

But there is more than a casual or accidental symptomatic relation between cholera and certain other so-called blood-diseases, and particularly are septic cholera from poisonous gases and epidemic cholera closely allied. This is also particularly true of cholera and dysentery,

¹ *Phila. Med. Times*, iii., p. 649.

² *Am. Jour. Med. Sci.*, cxv., 1869, p. 124.

³ *N. Y. Med. Jour.*, xxi., 2, Feb., 1875, p. 126.

⁴ *Op. cit.*, pp. 378-399.

⁵ *Op. cit.*, p. 33.

and one tends to increase the liability to and the danger of the other, and the latter is a not infrequent sequel to the more dreaded disease. In attempting to develop this feature of the case I trust that I may not seem to be pressing too far the doctrine of the correlation of diseases, nor by an indiscreet advocacy bring ridicule upon the powers of a valuable medicine. Just as our scientific vision gains a wider range, do we better see the alliances that seemingly different conditions sustain with each other. If such a figure may be tolerated in a serious paper, I would say that cholera, dysentery, and the periodic fevers are a triune dæmon, each of whose faces represents a peculiar influence to be propitiated by especial offerings. We may never detect the real essence of this malignant trinity, and may never weave a spell that shall completely exorcise it: but it is a worthy ambition to unravel such a secret and to compose such an incantation. The likeness between some two of these diseases strikes every one who studies the subject; and Professor Maclean, in 1866, announced a generalization identical with the suggestion just made, at which I arrived independently but far later chronologically. It is probable that many others have reached the same conclusion. He says,¹ speaking of malaria, in which he firmly believes: "It is the cause of intermittent and remittent fevers and their sequels: it 'underlies' the cause of dysentery and cholera;" etc. There are certainly some very remarkable likenesses in the apparent origin if not in the outward expression of these diseases; and, speaking generally, we may include cholera morbus or the sporadic form under the wider category, just as the ordinary catarrhal dysentery is a variety of the epidemic disease. In both, the infectious or catholic estates embrace the subdivisions. Niemeyer² distinctly asserts that epidemic dysentery is closely allied to cholera, and points out some marked constitutional similarities. He says:³ "We do not know why, but great epidemics of intermittent have often preceded epidemics of Asiatic cholera. In hot countries cholera and intermittent and oftener dysentery and intermittent frequently prevail at the same time;" and, speaking of the course of the severer forms of remittent fever,⁴ says that in some cases there are "symptoms of cholera or dysentery." "Hirsch says it is a well-known

¹ Reynolds's *System*, i., p. 52.

² p. 622.

³ *Op. cit.*, ii., p. 667.

⁴ p. 367.

fact, that malarial fever has preceded outbreaks of cholera, not only in single places or particular regions, but in an almost pandemic distribution, and there is every reason to believe that malaria and cholera devastate the same ground."¹ Aitken's distinct testimony as to the relation of malaria and dysentery has already been introduced. Hertz reports similar facts but does not announce the same conclusion. He says:² "Intermittent fever and dysentery often occur side by side, both endemically and epidemically, the former even being complicated by the latter, without our necessarily supposing that there is any relationship between the two miasms." And speaking of cholera and malaria, he says:³ "We find certain regions, as in India, where the two flourish side by side. In the cholera epidemics of 1831 and 1848, [in Germany,] on the other hand, intermittent fever disappeared to break out again on the cessation of the cholera, or to remain suppressed for years, in some places where it had previously been endemic." He describes⁴ the choleraic form of intermittent and very graphically⁵ the dysenteric variety. Dr. Wm. J. Johnson,⁶ in his account of the dysentery epidemic of 1857 in southwestern Georgia, sketches certain sets of cases that "resembled in many respects those of malignant cholera." He thinks: "if they had occurred in a cholera district they would have been so regarded by the most competent medical judges, especially if they had been disconnected with cases of epidemic dysentery." And the description that he gives of the symptoms, including the rice-water discharges, is identical with that of Asiatic cholera. Similar cases, uniformly fatal, occurred to other physicians during the prevalence of the epidemic. Dr. Woodson noted in connection with his series of dysenteric cases near Gallatin, Tenn., treated by ipecacuanha in the summer of 1873, the interesting fact that "previous to their outbreak a diarrhoeal tendency had been observed in the same district, which if not a consequence was at least coincident with the prevalence of epidemic cholera at Nashville and Gallatin." It cannot be necessary to multiply examples of coëxisting outbreaks.

In view of what I conceive to be the therapeutical power of ipecacu-

¹ Peters, *op. cit.*, p. 127.

³ p. 580.

⁶ p. 610.

² Ziemssen's *Cyclopædia*, Am. ed., ii., p. 579.

⁴ p. 680.

⁶ *N. A. Med.-chir. Rev.*, Mar., 1858, p. 296.

anha as explained in the Second Part of this work, and the pathology and general nature of cholera as just set forth, I propose that medicine in large, non-emetic, stimulant doses in the treatment of this disease.

Before elaborating in detail the reasons that support this proposition, I shall rehearse briefly the historical connection that already exists between the two. The treatment of cholera well illustrates Cazeaux's¹ general remark, that, "as is always the case in therapeutics, abundance means dearth; there is much less seeking where an infallible remedy is at hand." In the absence of not only an infallible but a probable remedy, the whole materia medica has been ransacked for a cure for the pestilence that has girdled and devastated the globe; and in these trials so common a drug as ipecacuanha has been frequently employed, but generally, if not universally, as an emetic. Epidemic cholera first appeared in England, on the fleet in the Medway, in the summer of 1831.² Dr. James Hall, R. N., in charge, regarding the evacuations by the stomach and bowels as attempts of nature to free the system from an offending cause, gave ipecacuanha to produce full and free vomiting, mild rhubarb cathartics, and then opium to remove spasms. "Confinement to bed, and emetics of ipecac., hot oatmeal porridge, with opium, are said to have acted like a charm."³ The French physicians in 1832 struck by its resemblance to dysentery proposed ipecacuanha. As the French employ that medicine emetically in dysentery, they probably did so here. "M. Grisolle believed the remedy to be a specific (*crut à la spécificité de ce médicament*) against the cholera; but in 1849 he was compelled to admit the slight utility of its administration."⁴ M. Decugis says⁵ that it failed at the *Charité* (date not given,) and that it was used unsuccessfully at Toulon in 1865. Peters⁶ writes: "Others say it has been given successfully in five- or ten-grain doses every five or ten minutes. It causes violent attempts at vomiting, but after three or four doses tolerance is established. In the Paris hospitals, in 1865, ten to twenty grains were given whenever there was much vomiting." I have not been able to find the originals or the particulars of these statements. Waring in his earlier editions presents⁷

¹ *Op. cit.*, p. 942.

² *Edin. Med. & Surg. Jour.*,* xxxvii., 1832, p. 295.

³ *Cholera Epidem.* 1873, p. 556.

⁴ Decugis, *op. cit.*, p. 40.

⁵ *Loc. cit.*

⁶ *Op. cit.*, p. 139.

⁷ 1st Am. ed., p. 340.

a not very clear table of mortality by Mr. Ross, and remarks¹ that the mortality under full emetic doses is very large. He reprobates its use as an eliminative. Dr. George Johnson has used it in his eliminative practice, and it would be interesting to analyze his statistics with a view to observe if the so-called tolerance was established, and whether there was any observable connection between the degree of his success and the amount of this medicine that was retained. But on the whole, Dr. Johnson's evacuant treatment has not been successful.² The practical record of repeated emesis is therefore against that use of ipecacuanha. Waring, however, suggests:³ "A far more promising practice is to administer it in very small often-repeated doses, in the manner employed in hæmorrhages by Mr. Trenor. In this latter affection, even when a state of collapse supervened, the vital powers recovered themselves in a striking manner under the use of ipecacuanha: and the same remedy seems to merit a trial in cholera, even in the stage of collapse; the many points of similarity between cholera and profuse hæmorrhage would alone suggest its more probable utility. The more recently ascertained facts with regard to the power of minute doses to arrest vomiting are strongly in favor of its probable efficiency." Directly in this connection Dr. Waring offers no rationale for its presumed action in such cases; but he had previously remarked that ipecacuanha "possesses considerable sedative powers, as is shown by its influence in hæmorrhagic diseases." He therefore regards it as suitable for cholera from being a sedative agent, and he further advises "very small" doses, because "minute" quantities often restrain vomiting.

If hypothetical conditions may be discussed in the absence of practical demonstration, it would appear that one of the differences between the hæmorrhagic and choleraic conditions is that in the former the capillary lesion is, so to speak, passive, the result of exhaustion; while in the latter it is active, being impressed by the positive toxic principle. So, while small doses might be trusted to restore the capillary tone in the one, or negative, condition, unless we embrace the doctrine of attenuations and potencies, we must use larger quantities to overcome the active morbid influence. The matter of emesis seems

¹ p. 392.

² *Lancet*, Oct. 7th, Nov. 11th, 1871.

³ 1st Am. ed., p. 392; 2d, p. 361.

to be influenced less by the size of the dose than by the manner of its administration. Those given by Mr. Trenor "varied from gr. j.-ij. every fifteen or thirty minutes until nausea was felt;"¹ while in Dr. Pye's² cases vomiting generally occurred three or four times after a dose that averaged two grains. On the other hand I have repeatedly given twenty-five grains without inducing vomiting, and one and two drachms have been similarly administered in East India practice.

I would therefore advise for a cholera patient already vomiting or purging, or both, a drachm dose of the powder in a very small quantity of fluid, to be repeated as to quantity and interval *pro re natâ*.

Attention is next invited to an examination of certain opinions held as to the special nature of the cholera and to the treatment based upon them.

It is well known that a number of very respectable physicians have always held that Asiatic cholera is essentially a malarial disease; that it is only a virulent modification of the ordinary swamp fevers; that it is, in fact, the algid variety of pernicious intermittent; and some have gone so far as to declare that sleeping above the ground floor is the best prophylaxis. In the epidemic of 1833, by the first medical men of Lexington, Ky., "it seems to have been accepted as an unanswerable fact that cholera arises in the very same circumstances in which fever and dysentery arise."³ The same opinion obtains to this day among a large number of the practitioners in the Mississippi Valley, among whom are some of their very best men.⁴ M. Marey⁵ finds a resemblance "between cholera and the paroxysmal fevers, which latter he considers as under the control of the vaso-motor nerves." Dr. Goodeve⁶ says: "I have seen people under the influence of malarious poison in Calcutta lie for hours as cold and pulseless and as embarrassed in breathing as in cholera." For the purposes of this work it is unnecessary to quote further particulars. Recalling to mind the remarks already made upon dysentery and intermittent, enough has been presented to show that the similarity in etiology and in constitution, however distinct and diverse their normal types, is sufficient to establish a close pathological kinship. This likeness, sometimes consciously and

¹ Waring, 2d Am. ed., p. 360.

² *Med. Obs. & Inq.*, 1757, p. i., 240.

³ *Cholera Epidemic* 1873, p. 590.

⁴ *Loc. cit.*

⁵ *Gaz. Hebdom.*,* Nov. 24th, Dec. 1st, 1865; Burrall, *op. cit.*, p. 137.

⁶ Reynolds's *System*, i., p. 172.

sometimes incidentally, has impressed the treatment of cholera, unsatisfactory as a whole as treatment there has been. Thus Dr. Munro,¹ of the British Army, believes that remittent, intermittent, congestive remittent, [pernicious,] cholera, yellow fever and heat apoplexy [insolatio] are different degrees of paralysis of the sympathetic nervous system, and that quinine is the remedy most to be relied on in all of them. He does not include dysentery in the group, and he denies the existence of malaria. Dr. John Murray,² late Inspector-General of Hospitals, Bengal, strongly advises in the premonitory stage the use of two-grain doses of quinine three times a day.³ Prof. O. F. Manson,⁴ of Richmond, believes cholera infantum to be essentially a malarial fever and treats it in great measure with quinine. Whether they are entirely correct or not, these indications show the tendency of medical thought to drift in this direction.

If the pathological views that have been expressed are well founded, we are to look in cholera not for a solitary drug as a specific or antidote, a neutralizer, as vaccination nullifies variola, but for such ganglionic and vaso-motor stimuli as may relieve the pathological consequences and antagonize the depressant influence of the disease. And this indeed is the direction in which advanced physicians are working. Atropia, understood to cause capillary anæmia, which has been used hypodermically with a certain degree of success, and ergot used less successfully, have been employed on this general ground. And on the same pathological basis stand other valuable contributions made to this subject. Thus in 1873 Dr. William Pepper⁵ suggested the intravenous injection in solution of the bromide of potassium. I do not know that this has been practised. Dr. Pepper, however, was anticipated in its general use by Dr. James Begbie,⁶ of Scotland, who from identical reasoning recommended it, and on whose recommendation it was used in the Leith and Edinburgh Cholera Hospitals. Dr. Begbie says that "although not possessing the properties of an antidote to the poison of

¹ *Army Med. Dept. Reports for 1872*, London, 1874, pp. 266-274.

² *Observations on the Pathology and Treatment of Cholera*,* 1874.

³ *Phila. Med. Times*, iv., 1874, p. 636.

⁴ *Virginia Med. Monthly*, ii., Aug., 1875, p. 328.

⁵ *Phila. Med. Times*, iii., pp. 651, 742.

⁶ *Edin. Jour.*, 1866, xii., pp. 488, 490.

cholera, though not a specific to the shock of this terrible disease, [it] has certainly stript it of some of its terrors." This has received an independent and strong support by a series of cases published by Dr. Salvator Caro,¹ in 1869. His paper gives in detail twenty out of one hundred and sixty-three cases, running through the whole morbid scale from simple serous diarrhœa to cholera infantum, dysentery and septic cholera, and embracing young and old, where it was successfully used. The conclusions of Dr. Robert Amory,² one of the latest investigators, (1872,) confirm the theoretical views that led to its employment. He has satisfied himself that "the effects of the drug are produced by its direct action upon the blood-vessels or the vaso-motor system which controls the contraction of those vessels." H. C. Wood,³ however, regards this as not proved.

There are some empirical facts in the treatment of cholera that ordinarily are not associated with the argument that governs this paper, but which I think are susceptible of an explanation that confirms rather than disproves this view. Impelled by various motives, or by no distinct motive at all, very many physicians have always made calomel their chief reliance in cholera. The statistical tables are complicated and obscure, but it is demonstrable that when uncombined calomel has been given in large doses, that is from twenty to one hundred and twenty grains, the results have been at least as favorable as those following other methods. In the latest important work⁴ on the subject the compiler draws no distinction between the treatment by large and by small doses, but consolidates them⁵ as yielding a mortality of 23 per cent. This is less than any other excepting that following the use of sulphuric acid, (8 per cent.,)—which however only received a trial in 64 cases out of 7,356. But those that are reported in detail give very favorable results for the uncombined use of large doses, of which the most notable is the series reported⁶ by Dr. Keller, of Paris, Ky. His average dose for the adult was two drachms rubbed up with a little charcoal. The text-books of practice generally fail to recognize that the action of thirty grains of calomel differs in kind more than it does in degree from that of five grains.

¹ *Med. Record*, iv., p. 195.

² *Phila. Med. Times*, ii., p. 335.

³ 1st ed., pp. 281, 283.

⁴ *Report on the Cholera Epidemic of 1873 in the United States*.

⁵ p. 31.

⁶ p. 290.

But that large doses have a distinct power, observant physicians know and frequently act upon, although it is rarely referred to in print. The most practical paper on this power that I have seen is Dr. F. D. Lente's,¹ claiming for large (20-30 grain) doses a sedative and directly curative effect in many cases of croup, dysentery and cholera morbus. To call this action sedative appears a misuse of terms. Tranquillizing, as is incidentally applied² is better, for the conditions relieved are not those of stimulation. Depression equally with excessive action will create disturbance, and tranquillity follows levelling up as well as levelling down. Dr. Lente says,³ on the authority of Billing,⁴ Annesley⁵ and Beaumont, in his observations on St. Martin, that the peculiar power of the heavy uncombined dose is to relieve capillary hyperæmia by producing contraction of those vessels. These references are not exact enough to be verified, and Stillé,⁶ referring only to Ainslie and ignoring Annesley as the advocate of the larger quantities—and between the two, both of whom wrote on Indian diseases about the same time, I have not the books to decide—entirely denies this capillary influence, which Lente says⁷ Headland also does. It is evidently an unsettled point; but the relief of capillary hyperæmia is a special indication in the intestinal disorders, and if, as seems probable, that is its action in large quantities, it supplies a logical reason for its fearless use in choleraic disease, and the encouragement of example for that employment of ipecacuanha here advocated.

But as one of the requirements in cholera is a remedy to relieve the hyperæmia of the intestinal capillaries, so this relief is not to be reached by drainage, by evacuation of the serous fluids that have accumulated in the walls and in the canal of the bowel, but by altering the nervous condition by which the leakage is permitted. The cause, not the consequence, is the point for attack. If the positions heretofore made as to the power of ipecacuanha are well taken, it follows as far as *a priori* reasoning can be relied on, that there are a cluster of reasons to ratify its non-emetic administration here. Its control of diseases that etiologically resemble cholera has been discussed. To rehearse its powers symptomatically we find: the vomit-

¹ N. Y. Med. Jour., xi., 1, Mar., 1870, p. 1. ² p. 21. ³ pp. 2, 21.

⁴ First Principles of Medicine.*

⁵ Sketches of Diseases of India.*

⁶ 1st ed., ii., pp. 795-6.

⁷ p. 3.

ing and purging of cholera morbus and cholera infantum, which are mere types of the epidemic disease, have subsided under its use. The colliquative perspirations of debility, whose mechanism is identical with that of the exhausting cold sweats of cholera, are dried up by it. It has drawn the sting of severe abdominal pain. The intestinal lesions of dysentery that, *mutatis mutandis*, so closely resemble those of cholera, disappear before it. In short, the profound nervous depression and nearly all the individual symptoms that mark the graver disease find, under one form or another, a counter agent in this drug.

Besides the features just sketched, there are three other fragments, not made use of by others, that I desire to introduce into this mosaic, imperfect and perhaps unintelligible to some as it may even then remain. The first refers to the characteristic change of voice—the vox cholERICA, technically. This is generally attributed to the mechanical condition of the vocal cords.¹ I apprehend, however, that the spinal accessory, which is the nerve of phonation and which very closely anastomoses with the sympathetic, shares largely in the disturbance of the latter. But in aphonia under other circumstances “Dr. Robertson² states that he has seen the most conspicuous benefit derived from ipecacuanha in full emetic doses.”³ As at other times, the emesis here may be superfluous, and this use of the drug may indicate the more important application.

The second concerns the condition of the gall-bladder in collapse, and the absence and reappearance of bilious stools. An essential, if not the pathognomonic, symptom of the disease, notwithstanding its misnomer, is the absence, not the flow, of bile; and a large section of the profession has sedulously occupied itself by the employment of presumed cholagogues in the attempt to reëstablish that discharge; for the reappearance of bilious stools is universally hailed as a sign of convalescence. Now the gall-bladder is generally found filled in collapse, (notwithstanding that vomiting is supposed to mechanically force out its contents,) and the retention of bile is only the sign, not the cause of the disease. Undoubtedly bile flows because convalescence begins; health does not return because bile flows. And we

¹ Flint, *Princ. and Prac.*, 2d ed., p. 461. Lebert, Ziemssen's *Cyclopædia*, Am. ed., i., p. 426.

² *Cyclop. Prac. Med.*,* i., p. 118.

³ Waring, 1st Am. ed., p. 389.

may readily understand why this is so when we remember that the muscular tissue of the gall-bladder is unstriated and is under the control of the sympathetic. If that nerve is paralyzed this receptacle does not give vent to its contents; when the sympathetic reasserts its power the discharge reappears.

The third is the following. Mr. Sedgwick, opposing the purgatives of the Johnsonian teaching, incidentally uses these words:¹ "A careful and scientific investigation of the stage of convalescence, especially with reference to the occurrence of temporary glycosuria," etc. I do not know whether he refers to temporary glycosuria as a well-known and admitted fact, or means to suggest that it may occur and should be looked for. The standard works that I have been able to consult do not speak of it, and the references supplied by Billings's² admirable bibliography are beyond my reach. For myself, I do not know whether sugar is present in the urine that begins to appear with the establishment of reaction, or, if it is, what explanation has been offered. But if it should be the case that it is, it seems susceptible of this interpretation, curious from the nice interplay of somewhat complicated conditions and affording another argument for the employment of the drug. It is believed that diabetes depends on the dilatation of the capillaries of, and on the consequently more rapid circulation of blood through, the liver, and that it follows the paralysis or exhaustion of that part of the sympathetic that supplies it. Professor Cyon³ has shown that the fibres composing the annulus of Vieussens particularly preside over the hepatic circulation, and that their irritation induces the diabetic condition. But if the entire abdominal sympathetic is cut or paralyzed, as is the case in cholera, diabetes does not occur, because "those parts of the nervous system contain the vaso-motor fibres for the vessels of the intestines: and when they are cut the vessels dilate, and blood accumulates in them to such an enormous extent that there is either too little blood re-

¹ *Lancet*, Dec., 1871, p. 646.

² *Cholera Epidemic* 1873, pp. 942, 958. (They are: Gubler—*Glycosurie dans le choléra*,* *L'Abeille méd.*, 1867, xxiv., pp. 17-19; *Glycosurie transitoire pendant la période de réaction du choléra*,* *Bull. et mém. soc. méd. des hôp. de Paris*, 1868, iv., pp. 267-268. W. Sedgwick—*On temporary glycosuria as a sequel of cholera*,* *Med.-chir. Proceedings*, 1867-71, vi., pp. 351-319; also in *Med.-chir. Trans.*, 1871, liv., pp. 63-93.)

³ *Brit. Med. Jour.*,* Dec. 23d, 1871; *Phila. Med. Times*, ii., p. 196.

maining, or it is under too low pressure for the circulation in the liver to become increased above its normal, even though its vessels be dilated." But after death in collapse we find the liver is gorged with blood, that is to say when its sympathetic fibres are paralyzed. We may therefore naturally infer that when reaction begins and the circulation tends to recover its natural tone, more blood than usual passes through the liver under the combined effect of the partly dilated vessels and the increased force of the circulation, and we might therefore look then for the temporary glycosuria that could occur neither in the profound stage nor when the health and the normal circulation are restored. And this pathological condition gives support to the therapeutical view here advocated when we remember that as long ago as 1862 Pécholier announced "that in animals killed by it [ipecacuanha] no hepatic glucose can be found."¹ In his *Recherches* he says² "*nous avons constaté des efforts des vomissements, * * la disparition du sucre dans le foie.*" The inference may of course be drawn that ipecacuanha suspends the glycogenic function because it acts upon the vaso-motors, through the sympathetic, in directly the reverse manner to that in which traumatic injury or cholera poison is active. The disease paralyzes the nerves and dilates the vessels; the drug stimulates the nerves and contracts the vessels. These three explanations have not before been offered so far as I am aware, and to my mind they are satisfactory.

The facts and arguments that have been presented all tend to raise at least a fair presumption in our favor when we anticipate that the hydrorrhagia of the more alarming pestilence may cease as promptly as the hæmatoic and other discharges that have already yielded to its power. But it requires faith and a certain kind of courage to administer to a patient already sadly vomiting what for two hundred years has been the type of an emetic. But used with care, I am confident that it checks that symptom if it depends on no extrinsic cause. It is the first step that counts: that taken the rest are easy. Authentic empirical illustrations of its power dot medical records for at least sixty years. Give ipecacuanha freely but cautiously—cautiously does not mean timidly—in the vomiting of exhaustion, and it will arrest it.

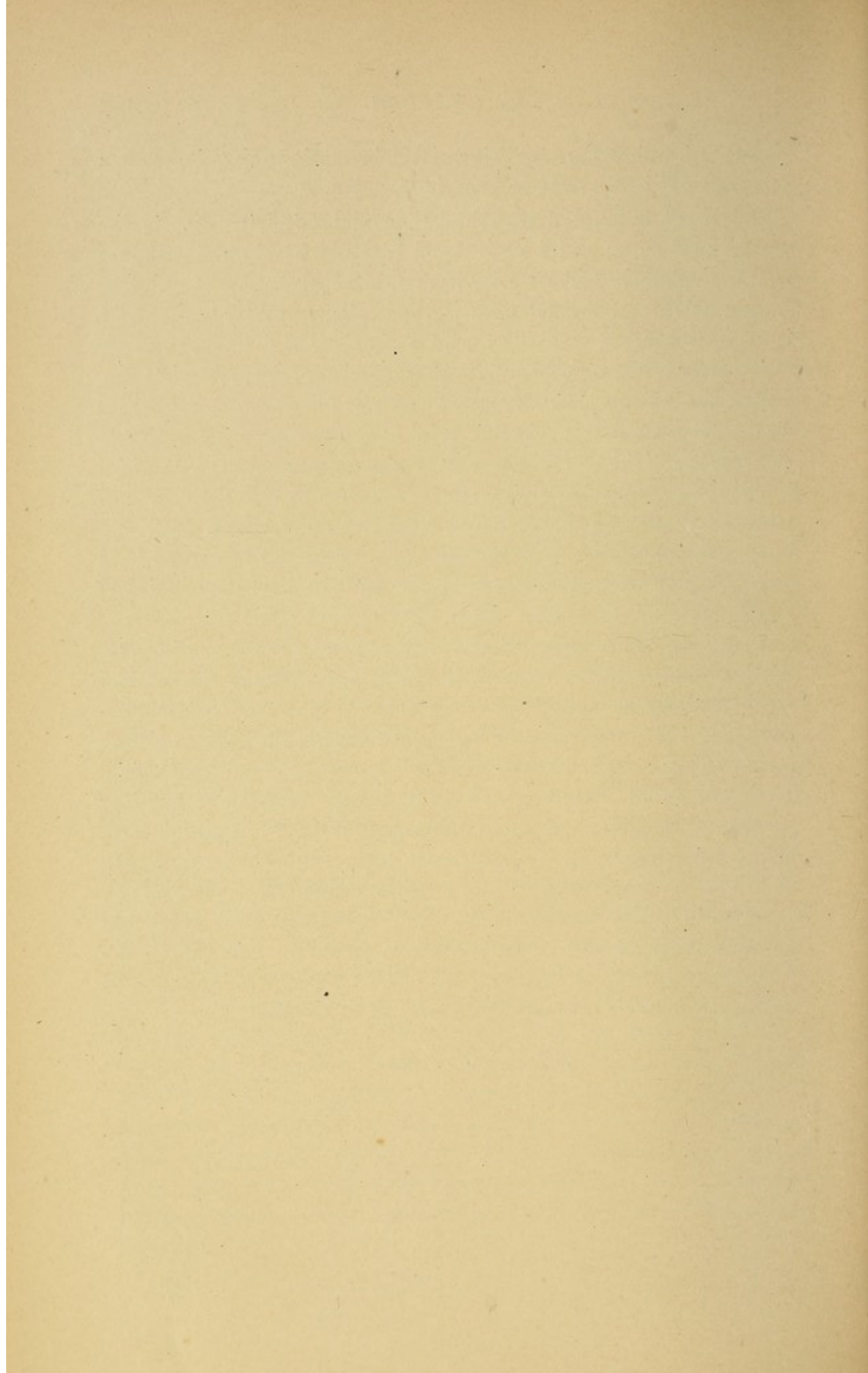
¹ H. C. Wood, 1st ed., p. 364, fr. *Gaz. Med.**

² *Op. cit.*, p. 40.

Therapeutical formulæ are not invariable, but anti-emesis quite as often as emesis will be the expression of its function.

This work is exposed with hesitation and misgiving, but in the utmost good faith; and I trust that I may not be charged with that vaulting ambition which o'erleaps itself in the choice of a subject. The subject indeed forced itself upon me, and being present I have sought to treat it honestly and fairly with a simple desire to increase the means of relieving human suffering. Conscious of its incompleteness, I have nevertheless made the little volume as full as my opportunities would allow, knowingly omitting nothing *pro* or *contra*. I have preferred to err on the side of prolixity by actually quoting the authorities and carefully explaining my own meaning, than to risk the charge of misrepresentation or assumption as to the views of others, or of ambiguity and cloudiness upon my own part. And the references have been carefully entered to assist, as far as they may, the studies of others.

If, as I sometimes hope, the work represented by the theoretical part of these papers has a value, it is chiefly due to those earnest and skilful laborers in the domain of science who have collected the material and have unselfishly offered it for the public good. I have merely selected certain cuttings and have drawn them into relationship. The little portal that has been built I hope may prove a minor entrance to the great cathedral of the common weal. It may, indeed, be but a doorway to some subterranean or useless gallery, or, at best, be fit only for transformation into a fantastic gargoyle to carry off the waste water of the scientific skies. Should it be so, the material has not been damaged and it can easily be recombined. If happily the former, but little praise belongs to the lucky designer who has stumbled upon the carefully-hewn and generously-given blocks.



INDEX OF AUTHORITIES.

ABBREVIATIONS.—Chol. inf., cholera infantum; chol. m., cholera morbus; dys., dysentery; hæm., hæmorrhage; ipec., ipecacuanha; op., opinion of the authority; rec., record of the authority, not cited at length; ref., reference to the authority, who is not directly quoted.

- Aasheim: ipec. in internal hæm., *rec.*, 45.
 Aëtius: diarrhœa ch., relief of, *rec.*, 91.
 Ainslie: calomel, large doses of, *ref.*, 143.
 Aitken: ipec. in dys., *op.*, 12; malaria to dys., relation of, *op.*, 90, *ref.*, 137.
 Akenside: ipec. in asthma, *rec.*, 54, *ref.*, 106; in dys., *op.*, 27, *rec.*, 80.
 Alston: chol. m. simulating cholera, *ref.*, 135.
 Amory: potassium bromide, action of, *op.*, 142.
 Annesley: calomel, large doses of, *op.*, 143.
 Anstie: delirium tremens, quinine in, *ref.*, 107; erysipelas and neuralgia, *ref.*, 109.
 Aristotle: dys., relief of, *rec.*, 90.
 Baglivi: ipec. in dys., *op.*, 46, 79; in hæm., *op.*, 46.
 Baker: ipec. in dys., *op.*, 80.
 Balmain: ipec. in ac. dys., *ref.*, 11, *rec.*, 81.
 Bancroft: ipec. in dys., *ref.*, 25.
 Bartholow: sweating, unilateral traumatic, *ref.*, 100.
 Baxter: ipec. by enema in dys., *rec.*, 34.
 Beach: ipec. in ac. dys., case, 16; in intermittent, case, 67.
 Beaumont: calomel, large doses of, *op.*, 143.
 Begbie, Jas.: potassium bromide in cholera, *rec.*, 141.
 Begbie, J. W.: ipec. in hepatitis, *op.*, 120.
 Bernard: perspiration, nervous control of, *ref.*, 100.
 Billing: calomel, large doses of, *op.*, 143.
 Blacklock: ipec. in ac. dys., *ref.*, 24.
 Bourdon: ipec. in chol. inf., *ref.*, 43.
 Budd: ipec. in dyspepsia, *op.*, 48, 102.
 Bulkley: ipec. in dys., *ref.*, 25; in ch. dys., *rec.*, 27.
 Byrne: quinine impression, *rec.*, 112.
 Caro: potassium bromide in chol. inf., etc., *rec.*, 142.
 Cazeaux: vomiting, nervous, *op.*, 103.
 Chapman: ipec. in hæm., *op.*, 44.
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 Clark, A.: cholera, pathology of, *op.*, 128, *ref.*, 130.
 Clark, —: ipec. in dys., *ref.*, 26.
 Cleghorn: ipec. in dys., *op.*, 80.
 Condie: cholera, perspiration in, *op.*, 131.
 Copland: ipec. in dys., *op.*, 82.
 Cornish: ipec. in dys., *ref.*, 24.
 Corvisart: ipec., action of, *ref.*, 103.
 Cullen: ipec. in dys., *op.*, 80.
 Cunningham: cholera, loss of epithelium in, *ref.*, 130.
 Curtin: cholera, sulphuric acid in, *ref.*, 129.
 Cyon: diabetes, pathology of, *rec.*, 145.
 Da Costa: cholera and chol. m., similarity of, *ref.*, 135; vomiting, nervous, *op.*, 103.
 Daubenton: ipec. in torpid digestion, *op.*, 102, *rec.*, 48.
 Davey: cholera, simulation of, *rec.*, 134.
 Davy: ipec. in dys., *ref.*, 24.
 Decugis: ipec. in cholera, *rec.*, 138; in puerperal fever, *ref.*, 69.
 Delioux: ipec. in dys., *rec.*, 11; in pneumonia, *rec.*, 118.

- Désormeaux : ipec. in puerperal fever, *rec.*, 69.
- De Wolf : ipec. in dys., *rec.*, 25.
- Dickson : pneumonia, pathology of, 117 ; ipec. in, *rec.*, 119.
- Docker : ipec. in dys., revived non-emetic use of, *ref.*, 11, *rec.*, 94 ; method of use, 22, *ref.*, 24 ; mode of action, *op.*, 95.
- Donaldson : ipec. in dys., *ref.*, 24.
- Douglas : ipec. in ch. dys., case, 29.
- Doucet : ipec. in puerperal fever, *rec.*, 69.
- Duboué : ergot in intermittent fever, *ref.*, 114.
- Duckworth : ipec. in dys., *ref.*, 26 ; by enema in dys., 33 ; topical use of, 74.
- Dutt : ipec. in intermittent, *rec.*, 59.
- Ebstein : perspiration, pathological, nervous influence in, *rec.*, 100.
- Eccles : ipec. in dys., *ref.*, 26.
- Edwards : ipec. in dys., *rec.*, 25.
- Elliott : ipec. in ac. dys., case, 21.
- Ewart : ipec. in dys., *ref.*, 24.
- Fayrer : ipec. in snake-bite, *op.*, 73.
- Flint : ipec. in dys., *op.*, 13 ; vox cholericæ, *ref.*, 144.
- Flint, Jr. : blood, destruction of red corpuscles of, 113 ; pneumogastric, distribution to intestine of, 131 ; sympathetic, effect of operations upon, 130 ; sympathetic, influence of, on diarrhœas, *op.*, 130 ; on urine, 131.
- Fox : hæm. from stomach, *rec.*, 100.
- Fuller : ipec. in vomiting, *rec.*, 52.
- Giacomini : ipec., action of, *op.*, 77.
- Goodeve : cholera, loss of epithelium in, *ref.*, 130 ; malarial collapse, *rec.*, 140.
- Gordon, Lady Duff : ipec. in dys., *rec.*, 26.
- Graves : ipec. by enema, *op.*, 32 ; ipec. in excessive perspiration, *rec.*, 48.
- Gray : cholera, diarrhœa of, and excessive sweating, analogy, *op.*, 131 ; cholera, loss of epithelium in, *op.*, 130.
- Greenhow : cholera, pathology of, *ref.*, 130.
- Greenleaf : ipec. in ch. dys., case, 28.
- Grisolle : ipec. in cholera, *op.*, 138.
- Gubler : cholera, glycosuria in, *ref.*, 145.
- Hall, James : ipec. in cholera, *ref.*, 138.
- Hall, J. C. : ipec. in dys., *rec.*, 25.
- Hartshorne : ipec. in dys., *op.*, 13.
- Headland : calomel, large doses of, *op.*, 143 ; ipec., action of, *op.*, 76.
- Helvetius : ipec. in dys., *ref.*, 11, 79.
- Hertz : cholera and malaria, relation of, *op.*, 137 ; dys., intermittent, *ref.*, 118 ; dys. and intermittent, relation of, *op.*, 136 ; ipec. in hæm., *op.*, 46 ; malaria, race-susceptibility to, *ref.*, 111 ; pneumonia, intermittent, *rec.*, 118.
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- Hillier : ipec. in infantile dys., by enema, *rec.*, 33.
- Hippocrates : dys., relief of, *rec.*, 90.
- Hirsch : cholera and malaria, *ref.*, 136.
- Hœhling : ipec. in dys., *rec.*, 25.
- Huchard : ipec. in chol. inf., *ref.*, 33.
- Huck : ipec. in ch. dys., *rec.*, 31.
- Jackson : intermittent and dys., *rec.*, 115.
- Janes : ipec. in dys., *ref.*, 25.
- Jeaffreson : cholera, pathology of, *ref.*, 130, *op.*, 131-2.
- Jessop : ipec. in dys., by enema, *rec.*, 34.
- Johnson, George : cholera, pathology of, *op.*, 127 ; cholera-treatment, results of, 127 ; ipec. in cholera, *ref.*, 139.
- Johnson, James : dys., inflammation in, *op.*, 88 ; dys., treatment of, 81 ; ipec. in dys., *op.*, 82.
- Johnson, W. J. : dys., choleraic form of, *rec.*, 137 ; ipec. by enema in dys., *rec.*, 32.
- Juergenson : pneumonia, nature of, *op.*, 117.
- Keller : cholera, large doses of calomel in, *rec.*, 142.
- King : ipec. in ch. dys., *rec.*, 30.
- Knox : ipec. in ac. dys., case, 19.
- Kollmann : pneumogastric, distribution to intestine of, *ref.*, 131.
- Lawrence : ipec. in capillary hæm., *op.*, 47.
- Leach : ipec. in ch. dys., *op.*, 32.
- Lebert : vox cholericæ, *ref.*, 144.
- Lee : ipec. in dys., *op.*, 82.
- LeHardy : ipec. in ac. dys., case, 20 ; in uterine vomiting, case, 52.
- Lente : calomel, large dose of, *ref.*, 143, *op.*, 143 ; vomiting, control of, *rec.*, 104.
- Lewis, M. : ipec. in dys., *rec.*, 26.
- Lewis, — : cholera, loss of epithelium in, *ref.*, 130.
- McClellan : cholera, nature and pathology of, *op.*, 127, *ref.*, 132 ; sulphuric acid in, *ref.*, 129.
- McKidd : ipec. in ch. diarrhœa, *rec.*, 27.
- Maclean : cholera, dysentery and intermittent correlated, *op.*, 136 ; cholera, malaria in, *op.*, 136 ; dys., definition of, 87 ; nature of, *op.*, 87 ; ulceration in, 89 ; hepatitis, pathology of, 120 ; action of ipec. in, *op.*, 120 ; ipec., general action of, *op.*, 120 ; ipec. in dys.,

- op.*, 12, 83, *rec.*, 26; in hepatitis, 70; malaria, *op.*, 114.
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- Marey: cholera, pathology of, *ref.*, 130; likeness of, to paroxysmal fevers, *op.*, 140.
- Martin, R.: ipec. in dys., *op.*, 82.
- Martin, W.: ipec. in capillary hæm., case, 47.
- Massey: ipec. in dys., *op.*, 24.
- Mead: ipec. in dys., *rec.*, 79.
- Meigs and Pepper: cholera, pathology of, *ref.*, 130; chol. inf., likeness of, to cholera, *op.*, 135; ipec. in dys., *op.*, 13.
- Mitchell: sweating, unilateral traumatic, *ref.*, 100.
- Monro: ipec. in dys., *op.*, 80.
- Moreau: sympathetic, section of intestinal, *rec.*, 130.
- Morrill: ipec. in dys., *ref.*, 25.
- Moseley: ipec. in dys., *rec.*, 80.
- Munro: cholera, nature of, *ref.*, 141; quinine in, *op.*, 141.
- Murray: cholera, quinine in, *op.*, 141.
- Mussy, de: ipec. in conjunctivitis, case, 74.
- Myers: ipec. in ac. diarrhœa, cases, 22; in ac. dys., case, 21; in intermittent fever, *rec.*, 67; in obstinate vomiting, case, 49.
- Newshafer: ipec. in canine debility, case, 50; in snake-bite in dogs, cases, 73.
- Niemeyer: cholera, pathology of, 129-30; cholera and dys., correlation of, *op.*, 136; cholera and intermittent, correlation of, *op.*, 136; dys. and intermittent, correlation of, *op.*, 136; ipec. in dys., *op.*, 12.
- Osborne: ipec. in uterine hæm., *rec.*, 45.
- Parkes: cholera, loss of epithelium in, *ref.*, 130.
- Patzki: ipec. in dys., *rec.*, 25.
- Paulus Ægineta: ch. diarrhœa, relief of, *rec.*, 91.
- Pécholier: ipec., action of, *op.*, 77; action of, on liver, *rec.*, 146.
- Pepper: cholera, pathology of, *rec.*, 130; potassium bromide in cholera, 141; perspiration, nervous control of, *ref.*, 100.
- Pereira: ipec. in asthma, *op.*, 53; in dys., *op.*, 82; general action of, *op.*, 77.
- Peters: ipec. in cholera, *ref.*, 138; sulphuric acid in cholera, 128; malaria and cholera, correlation of, *ref.*, 137.
- Peyrani: sympathetic, control over urine of, *ref.*, 131.
- Philip: asthma, galvanization in, *ref.*, 105.
- Phillips: ipec. in asthma, *rec.*, 54; in pulmonary hæm., *op.*, 46; in uterine hæm., *op.*, 46; in nervous cough, *rec.*, 53; in whooping cough, *rec.*, 53; in nervous vomiting, *op.*, 52.
- Piso: ipec. in dys., *ref.*, 11, *op.*, 79; ipec. as antidote to venom, *ref.*, 73.
- Playfair: ipec. in dys., *ref.*, 11, 81.
- Polichronie: chol. inf., likeness of, to cholera, *op.*, 135; ipec., general action of, *op.*, 78; ipec. in dys., *ref.*, 12, 26; in dys. by enema, *rec.*, 33; in chol. inf. by enema, *rec.*, 33, 43; in intermittent, *ref.*, 59; in excessive perspiration, *op.*, 101; in puerperal state, *op.*, 69.
- Pringle: ipec. in dys., *rec.*, 80; in ch. dys., *ref.*, 27, *rec.*, 31.
- Pye: ipec., power of small doses, *rec.*, 80, 140; ipec. in dys., *rec.*, 80.
- Read: ipec. in uterine hæm., cases, 43.
- Récamier: ipec. in puerperal state, *ref.*, 69.
- Rector: ipec. in drunkenness, case, 56.
- Ringer: ipec., action of, *op.*, 77; ipec. in dys., *ref.*, 14; in dyspepsia, *op.*, 102; in nervous coughs, *rec.*, 53.
- Robertson: ipec. in aphonia, *ref.*, 144.
- Ruschenberger: ipec. in dys., *rec.*, 24.
- Salter: ipec. in asthma, *op.*, 54.
- Samuel: hyperæmia after extirpation coeliac plexus, *ref.*, 130.
- Schenck: ipec. in delirium tremens, cases, 57.
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- Segond: ipec. in dys., *ref.*, 12.
- Shrady: ipec. in epistaxis, *rec.*, 47.
- Smith, Tyler: ipec. in uterine hæm., *op.*, 44, 98.
- Spear: ipec. in dys., *rec.*, 26.
- Stephen: ipec. in ac. dys., *rec.*, 25.
- Stillé: calomel, large doses of, *op.*, 143; cholera, *op.*, 135; cholera, sulphuric acid in, *ref.*, 129; ipec., general action of, *op.*, 77; in dys., *op.*, 25, 82; in hæm., *op.*, 99; in opium poisoning, *op.*, 58; in puerperal state, *ref.*, 69.
- Sunderlin: ipec., general action of, *op.*, 76.
- Sutherland: ipec. in ch. diarrhœa, case, 28.
- Swan: ipec. in dys., *rec.*, 80.
- Sydenham: ipec. in dys., *ref.*, 80.
- Taliaferro: ipec. in ac. dys., cases, 19-20; in intermittent, *rec.*, 67.
- Thomas: ipec. in snake-bite, *rec.*, 72.

- Thorowgood: ipec. in asthma, *op.*, 105; in ch. diarrhœa, *rec.*, 31.
 Tissot: ipec. in dys., *op.*, 80.
 Trenor: ipec. in hæm., *rec.*, 44; ipec., administration of, *ref.*, 139.
 Trousseau: dys., ulcer in, 88; ipec. in chol. inf., *ref.*, 43; in dys., *op.*, 12; in pulmonary hæm., *rec.*, 45, *op.*, 99; in puerperal state, *rec.*, 69-70.
 Trousseau and Pidoux: ipec. in internal hæm., *ref.*, 46.
 Turnbull: ipec., topical effects of, *rec.*, 74.
 Twining: ipec. in dys., *ref.*, 11, 82.
 Vidal: ipec. in erysipelas, *ref.*, 109.
 Von Martius: ipec., antidote to venom, *ref.*, 73.
 Ward: ipec. in ch. dys., *op.*, 32.
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 Whittingham: ipec. in dys., *rec.*, 24; in dys. by enema, *rec.*, 24, 32.
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INDEX OF SUBJECTS.

ABBREVIATIONS.—Chol. inf., cholera infantum; chol. m., cholera morbus; dys., dysentery; hæm., hæmorrhage; ipec., ipecacuanha.

- Antiperiodic: ipec. as an, 109, 114; cases, 59-67.
- Aphonia: ipec. in, 144.
- Asthma: galvanism in, 105; ipec. in, authorities on, 53-4; ipec. in, case, 54; pathology of, 105-6; uterine, 106.
- Atropia: in cholera, 141.
- Blood: red corpuscles, destruction of, 113.
- Bowels: *see intestines*.
- Calomel: in cholera, 142; large doses, action of, 143.
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