

Estrazulas¹ has presented important testimony showing that an epidemic of cholera in Paraguay beginning in 1866 (continuing as an endemic for three years), could not have been imported by means of human intercourse, through ships or otherwise; the peculiar circumstances of the war with Brazil making this impossible. At least it is certain that no quarantine, or other system of restrictions, could have done more, if so much, to prevent its conveyance.

The instances of apparent transmission of cholera by persons, which are quite exceptional, even if we admit a hundred or more authentic examples, are, as I believe, to be explained on the principle of *fomites*; of occasional, *very rare*, carrying of the material cause of the disease, the "germs" of it, in clothing, merchandise, or by the person of a human being; as one might carry skippers on a piece of cheese in his pocket, or a paper of seeds in his carpet bag.

All of Pettenkofer's and Thiersch's observations, in regard to subsoil accumulation and transit, and fecal fermentation after discharge, range themselves naturally under the one general fact which they exemplify, viz., that *animal decomposition is the one great promotive cause of cholera*; to which heat and moisture, etc., are merely adjuncts.

But that which suggested first to me this opinion was, the singular history of the outbreak at Columbia, Lancaster County, Pennsylvania, in September, 1854. Cholera had never visited that town before. It is not large or populous, has a rural site on the Susquehanna, and is not built densely enough to exclude malarial fevers. Why should it have cholera at all?

Visiting the town with other physicians of our city during the epidemic, I learned that an exceeding drought had reduced the channel of the river to an unusually low ebb, and that, in its bed, a short space above the town, a number of carcasses of sheep and other animals, thrown from the railroad trains, etc., were putrefying rankly in the sun. A reservoir which supplied many of the people with drinking-water was filled from the river not far from that spot, and the wind blew from it directly over the town. The first subsidence in the disease, we were afterwards told, attended a decided change in the wind.

At Pittsburg, shortly after the above events, a similar epidemic occurred. A gentleman on a visit to that locality not many days before the disease broke out, informed me that the same condition of the river existed there, with a like abundance of accumulated *putrefying animal matter* exposed to the sun.

In Rhode Island, in the autumn of the same year, I was informed that the local existence of cholera in a few spots, otherwise very healthy, might be traced, in coincidence at least, with a practice not uncommon along the shore of the sea or bays, of dragging up fish in quantities by nets, and spreading them out to rot for manure.

Prevention.—Quarantine is urged by many, in this country as well as in Europe, to exclude cholera. Is it available? Will it

¹ Amer. Journal of Med. Sciences, July, 1873.

do any good? I say, *no*. Theoretically, if the views advocated in the preceding pages are correct, it falls to the ground, of course. But, more than that, it *never has succeeded*.

Dr. Alison, of Edinburgh, wrote thus in 1854: "It is a fact that cholera has made its way, not uniformly, but very generally, in spite of cordons and quarantine regulations."

Dr. Gavin Milroy, one of the ablest and most industrious sanitarians of our time, published, about the same year, an essay with this title: "*The Cholera not to be Arrested by Quarantine.*" M. Cazalas, Inspector of the Sanitary Department of the French army, after full inquiry, has declared that cholera is non-contagious, and that its preventive should be not quarantine, but an international sanitary code. Dr. A. J. Payne, of the Bengal Medical Service, writes (1869) thus: "In a large majority of the examples in which the efficacy of isolation is affirmed, it is clearly provable that isolation cannot have had any influence on the events, and in no single instance has its necessity or usefulness been demonstrated." Dr. Bryden, of the Sanitary Commission, India,¹ says, that "the geographical distribution of the disease would not have been different had no Hurdwar gathering taken place." He also speaks of a "*cholera wave*," with definite directions of progress, and adds, that "experience in India is certainly on the whole opposed to the doctrine that human intercourse is the only, or even a principal, cause of the spread of the disease over any large area of country."

Pettenkofer, the leading advocate of the hypothesis that cholera is diffused by the influence of an organic poison contained in water, has announced his conviction that local sanitary measures are much more reliable for its prevention than quarantine. Sir W. Jenner has recently expressed the same opinion.²

Quarantine, if sound in theory even, could not avail, never has availed in practice. Its infraction for smuggling and other inducements is everywhere constant and notorious; *this cannot be prevented*. Macaulay (History of England, vol. v. p. 52) states that when a contraband trade was, in the time of William III., carried on between France and England on the southeastern coast, "it was a common saying among the inhabitants, that if the galleys were set up every quarter of a mile along the coast, the trade would still go on briskly."

One might think that the history of *blockade-running*, during the late rebellion in this country, might afford ample illustration and confirmation of this. Vain, indeed, would be the attempt to close our coast against the introduction of cholera, were it as contagious as smallpox, or as plague was once imagined to be.³

The evils of quarantine are great, almost incalculable. Sir John Bowring, speaking in the House of Commons in 1841, gave it as his belief that the losses from quarantine in the Mediterranean alone were not less than two or three millions sterling a year.

¹ Report on the Cholera of 1866-8 in Bengal, etc.

² Address before the Epidemiological Society, 1866; published 1869; p. 53.

³ The Governor of Eupatoria is said to have wished the British and French troops to undergo quarantine, at the opening of the Crimean war!

But what if, instead of preserving, quarantine actually involves sacrifice of life? No doubt this has many times occurred. With yellow fever the quarantine epidemic in New York harbor, a few years ago, exemplified this. In various quarters reports of travellers show the *miserics* and dangers of the lazaretto, and of the confinement on the vessels detained.

What more do we need than the instance of the steamer *England*, at Halifax? Forty passengers, one account says fifty (out of 1202), died on this vessel during the voyage. She was prohibited from entering port; all were detained on board, and by April 14, 1866, 130 more deaths occurred! In all, 159 died while in quarantine. If the eleven hundred and fifty passengers had been landed and scattered, I, for one, doubt the occurrence of the disease in a dozen of their number; especially as it was reported as *altogether confined to the steerage*.

Were such measures sure to preserve from the epidemic the whole people of a continent, a *hecatomb* like this might find excuse. In the face of facts I regard it as a barbarity. Pelissier, in Algiers, was thought a monster for suffocating a band of guerrillas in a cave; but what is this case of the *England* more like, except in motive? It is closing up hundreds of people for death, as though one might lock the doors and bar the windows against all escape of a thousand people from a burning church; such as that of which we read so harrowing an account, some time back, in South America.

But it will be asked, Would you abolish all quarantine—abandon all inspection of ships whatever? No; I would not. But I would abandon altogether the current *theory* of quarantine, as against cholera most particularly.

Ships should be inspected on approaching ports, because they may have unsanitary conditions intensified in them on a scale sufficiently large to be important. This is, or should be, a part of sanitary police. Nor should it (and here is a great point of difference) include *any* restriction of persons; at the most longer than enough for cleansing of the body and of the clothing, and purification of merchandise by fresh air, and possibly by some disinfecting process in certain cases.

I insist that SANITARY POLICE includes the sum total of available measures for the prevention of cholera in any place.

On this ground the means required are obvious and familiar. The thorough and frequent cleansing of all streets, alleys, courts, wharves, and vessels, private and public buildings, and empty lots; the abatement of all nuisances; daily removal of offal; efficient sewerage; and *conservancy*, *i. e.*, the cleansing, ventilation, and disinfection of cesspools and water-closets. Among all signs of danger of the location of cholera, none is more significant than the *privy odor*. Let it be everywhere annihilated. Lime, charcoal, dry earth, chloride of lime, Labarraque's chloride of soda, liquid coal-tar, chloride of zinc, and sulphate of iron are the most available of disinfectants.

The fresh white-washing of cellars is useful; thorough ventilation and drying of them and of all parts of habitations, still more so. Chloride of lime may be placed in a saucer in any suspected

room or other locality in a house. The same in the solid form, or solution of green vitriol, may be thrown daily into a foul privy; and, during cholera time, especially in the case of patients with the disease, every water-closet and vessel used may and should be disinfected constantly by a dilute solution of chloride of zinc, chloride of sodium, permanganate of potassium, or carbolic acid. The immediate removal of all discharges from the sick room, their disinfection and transportation to the safest possible place of elimination, are to be imperatively maintained. All foul clothing must be promptly washed or, if very bad, disinfected or burned.

These precautions have been proved to be capable of essentially limiting and mitigating the prevalence of epidemics.

Clapton, Burq, and some others have asserted a remarkable antagonism between the effects of *copper* on the human system and the susceptibility to cholera. M. Burq states that, during the epidemic of 1865-66 in France, only one in 1270 workers in copper was attacked; of workers in iron and steel, one in 209; and of those engaged on other metals, one in 178.

Personal Prevention.—One principle will suffice here: *to keep the system at par*; neither above its level of excitement, nor below that of its due strength.

For this, regularity of life is required in work, diet, mental movements, and all indulgences. The popular errors most common are, one, to suppose that living on rice, or rice-water, avoiding fruits or vegetables, etc., will be preventive; another, to think constant alcoholic stimulation beneficial for that end. *Both are certainly wrong.*

In 1832 and 1849, the late Dr. Joseph Hartshorne, then in very large practice, allowed in his family all its usual variety of food: boiled corn, peaches, watermelons, cantaloupes, etc., everything but cucumbers; and no cholera resulted from the liberty. My own subsequent experience justifies the practice. Of course care is always needed as to *quality* and *quantity*.

Among those most likely to die when attacked by this disease, the drunkard stands first, according to all records. Nor is he one whit less apt to be attacked than others. Temperance *in all things* is essential to safety during epidemics of every kind.

Treatment.—To *discuss* all the modes of management proposed for cholera would occupy too much space. I shall merely enumerate those which have attracted the most attention; and then give my view as to what is so well sustained as to be worthy of further trial and some confidence.

1. Bleeding.—This was largely practised in India in 1818-1825 by Corbyn, Scot, Annesley, and others. Without entering upon any argument about it, I will simply say that (as Dr. Brigham's quotations show) as many positive facts have been asserted on behalf of the success of bloodletting as of any other remedy in cholera.¹ My father bled in several cases in 1832, and had confidence in the treatment, as "the most effectual *anti-spasmodic*." In 1849

¹ In 1861, Surgeon G. R. Playfair, at Agra, India, found venesection to about 8 ounces followed by stimulants (especially chloroform) the most successful treatment. He reports more than 77 per cent. cured of genuine cholera.—*Ind. Med. Journal*, September, 1866, p. 275.

I bled in one case (a boy of twelve years of age) in incipient collapse. The blood at first was thick and black as tar; in a few minutes it flowed more freely, and the patient recovered. I confess that the only thing which makes it unlikely that I will ever try or advise the repetition of this practice is the want of courage to stem the overwhelming tide of professional and popular opposition now existing against it. In this timidity I may be wrong; if so, another generation may afford the demonstration of what is right in such a way that no one can gainsay it.

2. Calomel.—This, too, was an old East Indian remedy. Suggested by the almost universal absence of bile in the discharges, which was thought to indicate the need of stimulation of the torpid liver, it has been more largely given than any other medicine in cholera.

Unhesitatingly I hold the opinion that calomel is of no earthly use in cholera. The argument in its favor, from the absence of bile in the stools, is rebutted by the fact of its abundance in the gall-bladder; while the clinical experience quoted for its success is accounted for by the addition to it almost always of opium in the prescription. Nor is the amount of success with it, even then, great. Such is Dr. Gull's conclusion, based upon the examination of a great mass of evidence, given in his report.¹

Dr. Ayre, a British practitioner of some note, gave prominence to a modification of the old calomel treatment (in which twenty grains were sometimes given at once), by prescribing a grain of calomel every five minutes during the attack.

3. Saline Treatment.—Dr. Stevens, of Jamaica, proposed this, upon the view that the main pathological element in cholera is the loss of salts from the blood in the discharges. After the general failure of saline solutions (of common salt, carbonate and phosphate of sodium, etc.), given by the mouth, had been conceded, Dr. Mackintosh, of Edinburgh, and others tried the method of injection into the vein (half an ounce of common salt, and four scruples of bicarbonate of sodium, dissolved in ten pints of water, at 105° to 120° Fahrenheit). Under this plan, resorted to during collapse, of 156 patients in Dr. Mackintosh's hands, only 25 recovered. Remarkable improvement, almost like a resurrection, appeared in several, who afterwards fell again into collapse, and died. The suggestion has been recently made, that it may have been the temperature of the injected liquid which produced the benefit, so promising, and yet so transient.

In this place we may mention also the use by Dr. E. M. Hodder,² of Toronto, of the *transfusion of milk*, fourteen ounces at a time, into a vein, during the collapse. He reports the recovery of two cases out of three under this practice. The transfusion of lamb's blood, after the manner of Dr. Oscar Hasse, of Nordhausen, would appear to be more reasonable for trial. Kalisher³ has reported two successful cases of transfusion of blood in cholera.

4. Eliminative Treatment.—Dr. George Johnson, of London,

¹ Report, etc., of Drs. Baly and Gull, already cited.

² London Practitioner, January, 1873.

³ Inaug. Dissertation, Berlin, 1873.

has urged this with especial vigor. The castor-oil medication of cholera owes its trial to him. His lectures on the pathology and treatment of the disorder give a full and very intelligent exposition of his views. A prominent idea with him is that the general collapse is due especially to anæmia of the lungs, owing to spasmodic contraction of the pulmonary artery and its branches. I regard this as only a *part* of the *universal* arterial (and other) involuntary muscular spasm, belonging to what I have called the *ganglionic tetanus* of the collapse. But the essential feature of Dr. Johnson's pathology is the opinion that, the disease being toxæmic, a morbid poison exists, which must be *eliminated* from the blood; and that the discharges are the *media* of this elimination. Therefore, the vomiting and diarrhœa are salutary or relieving, and ought to be rather encouraged than checked. He goes even so far as to repudiate the commonly accepted belief, that "premonitory diarrhœa" or "cholérine" ought to be checked, considering it a fallacy to assert that those who are relieved of such symptoms by mild treatment are really, or would have been, cases of cholera at all.

I am entirely unable, from observation or reflection, to assent to these views. They have very few advocates or supporters, besides the distinguished physician whose name and ability command for them at present careful consideration. It is true that patients have died of cholera without vomiting or purging. I saw in 1849 a woman in collapse (from which she recovered) for several hours without either; and many such cases are on record; though in some, after death, the intestines have been found to be distended with rice-water liquid. But the checking of the discharges is almost always the sign of improvement and recovery of the patient. And we cannot, on Dr. Johnson's dictum, set aside or quash all the accumulated evidence, in Europe and in this country,¹ which shows that it is desirable and important to *check all watery diarrhœas in cholera times*—such fluxes having been proved to be often premonitory of cholera attacks.

5. Ice to the Spine.—Dr. John Chapman's ice-bags have threatened to become the "pathy" or therapy of the day, with some who are zealous and venturesome in experimental practice. Upon reasons of a physiological nature, not appropriate for discussion here, I disbelieve altogether in the theory of his therapeutics. As ice is useful when internally given in cholera, it *may* be safe and beneficial when applied to the spine. Not having seen it tried, I am not prepared to deny the possibility. It is one of the experiments to consider, in so desperate a disease. But if it *should* hereafter prove useful, I should explain that result quite otherwise than Dr. Chapman has done, in part at least.

6. Sulphuric Acid.—Dr. Cox, of England, afterwards Mr. Buxton and Dr. Fuller, and more recently Dr. Jules Worms, of Paris, have especially recommended dilute sulphuric acid in all stages of cholera. Many others especially report well of its action in the *premonitory diarrhœa*. Such an action would comport perfectly

¹ See Lectures on Cholera, by Prof. A. Clark, of New York; Report to the Royal College of Physicians, 1854; also, Madin, Briquet and Mignot, etc.

with the view I have taken of the *organic* nature of the poison of cholera; sulphuric acid being so potent a destroyer of everything organic, except such *mirabilia* as the *Acarus Crossii*.

Dr. Worms's treatment (based on results in 238 cases of cholera, and 150 of cholera, in 1865) is as follows: For prodromic diarrhoea, he makes a "mineral lemonade," of about half a drachm of concentrated sulphuric acid to a pint or more of sweetened decoction of salep (arrowroot would do as well). The patient is to take of this every hour a wineglassful till relieved. A similar practice, as I am informed by Dr. Curtin,¹ was found useful among the inmates of the Philadelphia Almshouse, in 1866.

For confirmed cholera, the patient being kept in complete repose, there is administered every half hour a glass of a similar lemonade, of the strength (about) of a drachm to the pint; ice and wine also being allowed *ad libitum*.

7. Opium in large doses.—This practice once had many advocates; now they are few. Prof. Austin Flint, of New York, is one of them; at least *morphia* is advised by him, in full dose, repeated if required. A great deal of evidence of the insufficiency of such a plan has been published; although it is *not worse* than several other methods. The *secondary fever* is apt to be more severe and more often fatal after treatment of the attack by large doses either of opiates or stimulants. Large quantities of brandy have been often used, with no good results.

Statistics are given, as follows, of the results of some of the most common modes of practice in cholera, by practitioners in Great Britain, as reported to the "Treatment Committee of the Medical Council of the Board of Health," 1854-1855.

Taking all grades of the disease, the deaths were—

	Per cent.
With Eliminants	71.7
Stimulants	54.0
Calomel and Opium	36.2
Chalk and Opium	20.3

Of *collapsed* cases, the mortality was—

	Per cent.
With Calomel and Opium	59.2
Larger doses of Calomel	60.9
Salines	62.9
Chalk and Opium	63.2
Calomel, small doses	73.9
Castor Oil	77.6
Sulphuric Acid	78.9

Much is uncertain obviously, in such statistics, without further account of dosage, circumstances, etc. But this seems to follow; that *neither treatment has much to boast of success*.

8. Treatment by antispasmodics and mild stimulants, in small doses at short intervals; with ice,² and external frictions, etc.—

¹ See Phila. Med. Times, July 12, 1873.

² Ice was used, and lauded, in cholera, by the celebrated Broussais, in 1832.

My experience with cholera has led me to give this mode of treatment the preference over all others. I first met with it in the practice of the late Prof. W. E. Horner, in 1849. Dr. Horner gave a mixture of chloroform, camphor, and laudanum, in small doses, every five minutes; each dose being followed by a piece of ice. I altered Prof. Horner's mixture to a tincture, for better preservation; adding some minor adjuvants. This recipe will be given directly. Frictions and sinapisms may also be used with advantage. The great merits of this plan are, its antispasmodic nature, and the administering of small doses at *very short intervals*. This is eminently demanded in cholera. Phthisis may be a complaint of years; whooping-cough, of months; typhus, of weeks; pneumonia, of days; but cholera must be numbered by its hours, half hours, or even minutes.

Having reached, then, this conclusion, I may add, that a *rationale* for such a treatment is discernible. I only follow many good authorities in the opinion that cholera is, symptomatically and pathologically, a poison-spasm, or tetanus of the ganglionic system. Taken early, that condition may be *prevented*, by mild opiates and stimulants, in the *premonitory* stage. Later, while any medicines will act, these will do the most. What is needed in confirmation of this explanation, more than is given by the action of quinine in preventing an anticipated chill, or, of the same, in full quininization, curing the paroxysmal disease (a *toxæmic neurosis*) of intermittent? An antagonistic influence against that which so perturbs innervation throughout the body; such is the whole definition that we can give of the remedial power shown in either case.

Let me be more specific in reference to treatment. Premonitory diarrhoea is very generally admitted to be present in a majority of cases of cholera.¹ In the East Indies, many writers, of different dates (Lawrie, 1832, Stewart Clark, 1864, etc.), assert such a stage to be an exception instead of the rule. But in India, they have a premonitory or incipient stage of another kind; characterized by great languor or depression, with restlessness, and sometimes ringing in the ears, occurring mostly at night. Stewart Clark states² that, in this stage, a mild opiate ("with a little calomel or blue pill"), with a cup of warm tea or a small dose of a diffusible stimulant, as a few grains of carbonate of ammonium, or a little weak warm brandy and water, will arrest the attack in a great portion of cases otherwise to become serious.

Such symptoms, as well as diarrhoea, should be noticed during a cholera epidemic; and I believe the same treatment will meet either. Rest, warmth, and mild, composing, but gently stimulating draughts; paregoric, aromatic spirit of ammonia, tincture of ginger, lavender, etc., with a mustard plaster over the abdomen, and a hot mustard foot-bath, if coldness of the body increase, or vomiting begin; such are safe, and I believe will be

¹ Barraut asserts fixed contraction of the pupil to be the first prodromic sign; M. Worms makes the same statement in regard to albuminuria.

² Hygiene of the Army in India, p. 12.

efficient remedies. The above may be called the first or prodromic stage.¹

The next has been well called, by Prof. A. Clark, the *rice-water* stage. For that, the treatment I have described as given to me by Prof. Horner is particularly adapted. My recipe, based upon his, is as follows:—

R.—Chloroform. et
Tinct. Opii et
Sp. Camph. et
Sp. Ammon. Aromat., āā fʒjss;
Creasot., gtt. iij;
Ol. Cinnamom. gtt. viij;
Sp. Vin. Gall., fʒij.—M.

Dissolve a teaspoonful of this in a wineglassful of ice-water; and give of that two teaspoonfuls *every five minutes*; followed each time by a lump of ice.² Iced water, or rice-water to which common salt and bicarbonate of sodium have been added, may be given, a little at a time, as a drink. I would also give a tablespoonful of brandy every hour or two.

Friction of the limbs with brandy and red pepper will be, along with large mustard-plasters on the back and pit of the stomach, useful to promote reaction.

The third stage is that of absolute collapse; blue, pulseless, shrunken, voiceless. Should a case go on, in spite of the above-mentioned treatment, into this state, what else can be done? All now seems to be desperate experimentation.³ Let the icebags be tried, and judge them by the trial. I would also try belladonna internally, as an antagonist of vascular spasm. Leclerc, of Tours, introduced it in 1854; Barraut, of Mauritius, used it ($\frac{1}{4}$ grain every half hour), and reported success. He also employed *hypodermic injections of sulphate of atropia*. Drs. Hodges, of St. Louis, and R. Saunders, report⁴ success with this last practice. It should be further tried in bad cases. So might be, as was suggested by me in 1855, *warm baths of infusion of stramonium leaves*; on the same indication. Dr. Brunton⁵ calls attention to the similarity between the symptoms of cholera and those following poisoning with "poisonous mushrooms" (*e. g.* *Amanita muscaria*); and to the experiments of Schmiedeberg, showing atropia to be remedial in such a condition, at least in animals. Drs. A. R. Hall, Higginson,⁶ and Blumenthal report the recovery of several severe cases under the use of *hydrate of chloral* (1 part in ten of water) by hypo-

¹ The published experience of Dr. Hamlin, in Constantinople, confirms the importance of the above early treatment.

² I take from Dr. Aitken's Practice the following recipe, much used and approved in India and England: R.—Ol. Anisi, Ol. Cajuput., Ol. Juniperi, āā ʒss; Æther, ʒss; Liq. Acid. Halleri (*i. e.* one part concentrated sulphuric acid to three parts of rectified spirit), ʒss; Tinct. Cinnam., ʒij.—M. Dose, ten drops every $\frac{1}{2}$ of an hour, in a tablespoonful of water.

³ Duchaussoy and Vernois assert the non-absorption of medicines given by the stomach during the collapse; but Magendie proved that a very slow absorption does occur.

⁴ Amer. Practitioner, July, 1873; and St. Louis Med. Journal, for the same month.

⁵ Med. Times and Gazette, Oct. 11, 1873.

⁶ Indian Medical Gazette, Nov. 1873, and Jan. 1874.

dermic injection. Dr. W. Pepper¹ has proposed the injection into a vein of a solution of *bromide of potassium*; about a pint of water, temperature 105° F., containing 50 to 75 grains of the bromide, being introduced at once. Also, the injection of hot liquids into the rectum; the warm bath (*hot baths cause distress* in the collapse), with *carbonate of ammonium* added, as used sometimes in malignant scarlet fever (West) in children; or the warm *mustard* bath. *Hot air*² bathing, if practicable, would be worth trying; and so would chlorine water, and the inhalation of nitrous oxide. Chloroform inhalation has been used as a palliative by some British practitioners. Let us confess honestly, for it is wise to do so, our art is here very weak; *fifty per cent. or more of collapsed cases die*; shall we not endeavor to *discover* new resources? All honor to those who, at the risk of their own lives, contend yet, with so forlorn a hope, and so little glory to be won. There is room for, and possibility of obtaining, a final triumph.

Two words remain still to be said, with short comment: *house to house visitation*, and *houses of refuge*. These are measures of great consequence, shown to be of value during cholera epidemics. The latter, especially, is of notable importance; that is, the establishment of Houses of Refuge in *salubrious places*, into which persons from tainted districts most liable to the disease may be received, on the occurrence there of the first cases.

That there *are* such tainted districts has been amply proven. Thus, Dr. Laycock has shown that in York, England, the first death from cholera occurred in the spot where plague had been traditionally the worst, in a badly drained district. In Edinburgh, the first case in 1848 occurred in the same house as did the first in 1832. In Holland, at the town of Groningen, in 1832 and 1848 but two houses in the better part of the town were attacked; the same houses exactly in both epidemics.

Dr. Alison reports that in the first three months of the epidemic at Edinburgh, in 1832, 353 persons were taken in at Houses of Refuge, from 70 tainted districts, houses and rooms in which decided cases or deaths had occurred. Of these, only 15 took the disease, and 7 died after removal. Of the 346 thus surviving brief exposure, it is very probable that more than half would have died had they remained in the midst of the infection. At Glasgow, in 1849, 401 persons were taken into Houses of Refuge from tainted districts; only 19 of these took the disease, and but 5 died. At Oxford, England, the same year, of 70 persons so taken in, none died. The London Board of Health, in its "General Report," gives the fact that of 1691 of whom the Board had accounts as taken into Houses of Refuge, but 33 were attacked, with only 10 deaths. These numbers would have been larger, but for the very common unwillingness of poor and ignorant people to leave their homes, chiefly from want of confidence in the greater safety of so doing. Could this be overcome, I have no doubt that an immense saving of life might be produced by Houses of Refuge, allowing also the

¹ Philadelphia Med. Times, July 12, and August 23, 1873.

² Dr. George Johnson states that he has seen the hot-air bath used without success.

places which are proved "foci of infection" to be thoroughly purified at once.

House to house visitation, by sanitary inspectors to abate nuisances, small and great, and by medical men to treat premonitory symptoms, might also have great preventive value. The establishment of cholera hospitals may be made necessary when the number of cases is great, especially as the greatest proportion always happens among the poor, who are ill provided for attendance at their homes.

DIATHESSES.

RHEUMATISM.

Several affections are, in popular language (partly sanctioned by medical usage), included under this term. 1. *Acute articular rheumatism*, or *rheumatic fever*. 2. "Chronic rheumatism," affecting the joints and sheaths of the muscles. 3. Syphilitic rheumatism, of the long and flat bones. 4. "Rheumatoid arthritis." 5. Myalgia. 6. "Gonorrhœal rheumatism."

Acute Rheumatism.—Only certain persons and families are liable to this affection upon any exposure. It is characterized by high fever with severe inflammation of several of the larger and smaller joints; which mostly, one after another, become swollen, red, hot, tender, and painful. The shoulders, wrists, knees, and ankles are most frequently so affected. Although with a full and rapid pulse, the skin, after the first week or so of the disorder, is often bathed in perspiration. The duration of an attack under various modes of treatment has averaged nearly three weeks. Sometimes it extends over months; and the *sequelæ*, or resulting *crippling* of the articulations, may remain for a lifetime.

The *danger* in rheumatic fever consists in the liability to endocarditis and pericarditis. A singular *complication* of it,¹ occasionally met with at a late stage, is *chorea*. Rheumatism may undergo *metastasis* from the joints to the bronchial tubes (rheumatic bronchitis), or, much more rarely, to the membranes of the brain. In feeble persons, the bowels or the womb may occasionally be involved.

The *blood* in acute rheumatism is found to contain an excess of fibrin. *Lactic acid* has, upon some basis of observation and experiment (Richardson), been asserted to be in excess in the blood as the characteristic pathological element in rheumatism.

Apart from the cardiac affections possible in its course, rheumatic fever is not often dangerous to life; but it is very painful and debilitating.

Treatment.—Many methods have been and still are in use. *Calomel and opium*; *opium* (Corrigan) alone, or with ipecac, as in Dover's powder; *lemon-juice*; *quinine*; *colchicum*; and *alkalies*; these are the most important. My conclusion upon the subject is, that the *alkaline* treatment is the best by far. Recoveries under it have, in my own practice as well as elsewhere, taken place sev-

¹ First remarked by Sée of Paris, and Senhouse in England.

eral times *within a week*, where the symptoms indicated a probably long attack. Of 417 cases, Dr. Fuller reports, under alkaline treatment, none fatal, and only nine suffering with cardiac complications. Dr. Dickinson,¹ in St. George's Hospital, in a considerable number of cases, found the proportion of those in which the heart was involved, under non-alkaline treatment, more than one in four; under alkalies, one in forty-eight. Carbonate or bicarbonate of potassium, with the Rochelle salt or nitrate of potassium (in scruple doses of the carbonate, or half drachm of the bicarbonate, with about the same of either of the other salts), thrice daily, will answer [F. 37, 45, 46]. Opiates, especially Dover's powder, at night, may do great good. Local application of *laudanum* (detained by oiled silk) to the painful joints, gives great relief.

Lemon-juice (O. Rees) has seemed to me a useful adjuvant (tablespoonful doses every three hours) in cardiac inflammations of rheumatic origin.

Quinine is sometimes very beneficial in enfeebled cases, with *free perspiration*. 10 or 15 grains may be given in a day. Briquet and others in Paris have given 60 grains in a day.

Colchicum is of decided service in the presence of the gouty diathesis; sometimes useful at the beginning of other cases.

Dr. Da Costa² reports favorable results, especially in the apparent prevention of cardiac affections, with *bromide of ammonium*, in fifteen or twenty grain doses.

Veratrum viride has been especially praised for its action, in small or moderate doses, in acute rheumatism, by Henser, in Germany.

Remarkable success has been reported in the treatment of rheumatism by "flying blister;" *i. e.*, the successive application, to different affected parts, of small blisters; allowed to produce moderate vesication only. Drs. Davies, Peacock, and other British physicians laud this practice.

Propylamin I have tried without success. Gaston, Besnier, and Dujardin-Beaumetz report very favorably of it.³ Dr. J. Russell Reynolds⁴ asserts good results in six out of eight cases treated with *tincture of chloride of iron*.

Dr. Anstie⁵ remarks upon the value of the chloride of iron as a *prophylactic* in incipient rheumatism. Dr. R. F. Dyer, of Ottawa, Illinois (*Amer. Journal of Med. Sciences*, July, 1874, p. 285), reports very good results as following the use of *podophyllin*, in doses which purge somewhat actively.

Chronic Rheumatism.—Any one may have this affection, which is, however, most common in those advancing in age. It is a sort of slow inflammation of the fibrous tissues investing the joints and muscles, following exposure to cold and wet. The aching pains are apt to be worst at night.

Cold may produce pain, without any inflammation. Five min-

¹ *Lancet*, Jan. and Feb. 1869. Drs. Gull and Sutton (*Lancet*, Jan. 16 and 30, 1869) insist that cases treated merely by rest in bed do as well without any medicine as with it. As above shown, I am not ready to accept this as proven.

² *Pennsylvania Hospital Reports*, 1869.

³ *London Med. Record*, Jan. 29, 1873.

⁴ *Brit. Med. Journal*, Aug. 28, 1869.

⁵ *The Practitioner*, Sept. 1871.