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"On Asiatic Cholera."

Inaugural dissertation by William
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"It is no ordinary privilege to be permitted, by means of books, to hold converse with the wise and great; besides the information which they communicate, we find that we imbibe their zeal, that we adopt their true and methods of research, and discipline our minds to the same course of thought and reasoning." Dr. Digby's Introductory Lecture, 1840

In the quotation here addressed, the writer has ably shown the advantage and pleasure to be derived from the perusal of the works of those authors who have written in a scientific and intelligent spirit on any subject of inquiring; during the last few years perhaps no subject in the world of medicine has been more fully discussed or more closely investigated than the disease termed "Asiatic Cholera"; and it is from a consciousness of benefit derived derived from a careful study of its records during the prevalence of the last epidemic
that I have selected it as the subject of the following pages.

In mentioning the different theories which have been advanced by different writers, it will be evident that the investigations have in some cases been founded on analogy and hypotheses, while others again have claims to consideration from the facts by which they are supported or maintained.

The basis therefore, on which a satisfactory conclusion is to be reached, depends not upon great names, however justly deserved; in this as in other cases (the observation of Locke may with justice be applied, "That reverence or prejudice must not be suffered to give beauty or deformity to any of their opinions")

In proceeding to discuss the subject in detail, I propose to consider: Firstly, its History. Secondly, the question of Causation. Thirdly, the nature of the Disease. Fourthly, its causes, predisposing and exciting. Fifthly, its progress and termination (including the symptoms), and Sixthly, its Treatment.
preventive and remedial.

15. The History.
A correct knowledge of the facts of ancient history can only be derived from the records of past ages, and the testimony procured from such sources as regards the disease in question is obscure, much being left open to inference or conjecture, neither of which can enable us to arrive at clear and unquestionable certainty.

Two circumstances especially may have contributed to this uncertainty; first, the comparatively infrequent commercial and general intercourse of earlier times; secondly, that though the same complaint may have existed in former ages, its precise form and many of its phenomena may have assumed an altered character as contrasted with our times, so as on comparison, at this distant period, not to be clearly and distinctly recognized.

It is an unquestionable fact that a disease in all its essential characters resembling the true Asiatic Cholera has existed long before the year 1017 in which its Memoir...
Invasion commenced at Jesso. Appelstain, Atius, Celsus, and Sydenham (in 1800) all spoke of a disease which was in its general character identical with the epidemics of the present age. Dr. Perley mentions it in Jatans in 1774. Mr. Somers describes its ravages on the Coromandel coast between the years 1774 and 1781, and Carter and Fieldstone refer to its universal prevalence during 1781 & 1782 owing to some peculiar state of climate prevalent during those years.

It would occupy too much space to recapitulate minutely the geographical progress of the disease, since the year 1817, when in the August of which year it first broke out at Jessore, in the Sunderbunds of Bengal. Let it be stated at once that during that and the succeeding year it ravaged the peninsula of India; in 1819 it reached Ceylon, advancing eastward into Assam, Siam, Malacca, and Sumatra. In June 1821 it invaded Yemen, Bassorah, & Persia, &c., but stopping by the desert which separates Persia from Syria, reappeared in
1822 between the Tigris and Euphrates; invaded Persia in 1822-23; during the latter year reached the borders of the Caspian Sea, and in 1828 appeared at Edinburg through the limit of European Russia.

It reached Moscow in 1830; Poland, Russia, and Germany in 1831; Sunderland in October of the same year, Edinburgh in January 1832, and in February broke out in London.

It is a curious fact that under the head of "insipid tea plague," Dr. Armstrong described a disease identical with that which subsequently appeared in this country, as having occurred at Shields in 1817; and Dr. Beaven speaks of a similar affection accompanying great euleses in Cephalonia of the same year, at the same date. Sixteen years after its first epidemic appearance in this country, it again returned with equally fatal results. This interlude has been remarked by Dr. Collier to be that in which certain epidemics tend to repeat their visits; thus the sweating sickness reappeared altogether five times between
1485 and 1531. 1551 - 1485 = 66 ÷ 4 = 16 1/2

Which agrees with the interval between the two visits of Asiatic Cholera.

It returned, as had been predicted, in the same cities and towns, and even in the same street as it had principally infected in 1832. In都市 it commenced in the very same house in which the epidemic of 1832 commenced; it began in Pollokshaws in the same room and the same bed as it had started from ten years before; the same foul ditch which was the scene of its first ravages in Bermondsey in 1832, witnessed its re-appearance in 1848 in its immediate vicinity. At first only in Holland, in 1832 it attacked in the better part of the city two houses only; the epidemic broke out in these two identical houses in 1848. If these singular facts are not viewed as coincidences merely, then how great an influence is exerted by particular predisposing causes; causes perhaps in each case of a different nature yet capable of producing similar results.
Circumstances of peculiarity and similar result.

A comparison of the number of deaths during the two epidemics gives in London, Paris, and Plymouth the following results.

**In London**
- In 1832: Deaths 6,729, Population 1,631,641
- Death Rate: 40.69
- Mortality 1832: 1 in 250, or 0.4 percent

**In Paris**
- In 1832: Deaths 18,402, Population 759,135
- Death Rate: 40.49
- Mortality 1832: 1 in 422.7

**In Plymouth**
- In 1832: Deaths 711, Population 31,600
- Death Rate: 49.76
- Mortality 1832: 1 in 39.571

The return are not sufficient to warrant any definite conclusion.
Secondly. The question of Contagion.

This has been a question of dispute, and will probably remain so. Arnot declared it to be his conviction that Cholera was not a contagious disease. The medical board of India declared for non-contagion. Dr. Sutherland, Sir Bowie, Dr. Bell who saw much of the disease in 1832 & the late Dr. Ferguson, all express their opinion that it is non-contagious. While on the other hand, many most eminent and useful physicians have expressed themselves fully in favor of the contagious nature of the disorder. Many facts may be adduced to show that it is occasionally contagious; whether under certain circumstances it sometimes ceases to possess this property, is not yet fully determined.

Its continued extension to all those great lines of traffic, where human intercourse was at its height, its frequent appearance in ports and harbours shortly after the arrival of vessels with cholera patients on board, and its avoidance of many parts of the country which were
just exposed to direct infection, are all strong arguments for the contagious theory.

The following facts tend also to exhibit the truth in a strong and unequivocal manner.

Dr. Plowman informs us that at Shrewsbury there were two cholera nurses; one of them caught the disease once, the other twice; first on the 22nd of October, and the second time on the 13th of November. The aunt who lived away in a part where no cholera had occurred was attacked on the 21st of November. No other case occurred in that part of the town.

W. Bablow at the Westminster Medical Society related the following case - Susannah D., aged 6, left West Ham on the 7th October 1849, during the prevalence of cholera there, for a village at some distance called White Burton, 48 hours after her arrival there, she was seized with cholera and died in 19 hours. Her grandmother was attacked on the 11th and died within 48 hours; and the grandfather fell ill on the 21st and died in 92 hours. No other cases occurred within 8 miles. W. Love a gentleman practicing at Lincoln records a case of a
don't get leaving that place for her native village in consequence of the prevalence of the disease. Not long after her arrival she was seized with fevers I believe it, but her mother and younger brother died of it and both died. These are instances that which occurred in one own country, but Dr. Copleston, whose inquiries into the subject were most extensive, patient, and laborious, comes to the conclusion of the communicability of the disease from a mass of evidence of the most convincing character. He tells us that when the disease appeared in Aleppo in 1822 the French consul placed himself and family and those who wished to join him in strict quarantine. This colony of 200 persons remained safe and well; in the city 4,000 persons died. Again quoting Dr. Denison, a Russian physician, he says, 'In Pariis from the 7th to the 31st of August, 2,170 persons died. All the surrounding country being infected, except, which was strictly protected by quarantine, entirely escaped.' Dr. Russell in the Medical
Gazette mentions the following most instructive case. The son of a village in the government of Persia, who was coachman to a nobleman at 50 feet distance, died of cholera. The father went to the place to collect his son's effects, & put on his clothes, which he wore a day or two. He was seized with cholera and died. 2 women who attended him and washed his body, died. The doctor arrived in time to see the fourth case, and finding the disease spread on that side of the village he had the street barricaded on the side it had not reached and intercepted all communication.

In that side in which the disease first broke out, more than 100 cases occurred, and 45 perished; the disease did not appear on the other side of the street. Cases of a similar character might be multiplied to a great extent, but these facts are of themselves sufficient to show that the disease is capable of localizing itself, and when so localized, if it lives for a season, of attacking those within its reach who are constitutionally
Predispoused to its attacks. Since it is, that many seeming exceptions occur to this the general rule, all of which are however inseparable to it when we consider the strange and perplexing appearances of contagious disease. Where there are such incursions and the changing elements of difference, the combinations of these may well give rise to every assignable variety of result. Dr. Collie in reference to this subject remarks, "The Asiatic Cholera, like any other epidemic, may be pronounced to be not appreciably, but weakly, capriciously, and inconsiderably contagious for a month or more; and shortly afterwards may become decidedly communicable, so that proximity of inhalation in contact with the sick, may become a formidable assisting cause, to make up, along with other forces, the aggregate sufficing force."
Thirdly: The nature of the Disease.

It would be advisably before bringing together the various theories which assign to Cholera its peculiar nature, to enumerate briefly the pathological appearances which it is characterized, so that it may be seen if any direct precedence exists between the causes after its course is done, and the agencies by which it is presumed to have originated.

The surface is generally, after death, rather less vivid than in the latter hours of existence; the pleura tendons of the hands and feet stand out in prominent relief. In most of the cases which I dissected during my residence at the Middlesex Hospital in 1848, I found the arteries of the brain water injected, and on its removal there was in some a quantity of dark blood like bile between it and the substance of the brain; the brain matter was also slightly adherent in some cases. The heart was full, the ventricles being in some cases distended with dark blood, in others only the right one thus prolonged. The lungs were generally filled with dark =
We didn’t blood; sometimes though rarely they were found collapsed. (At the hospital of
But the face there were found ecchymoses of the liver, spleen, kidneys, & lungs. And in the large intestines, the liver was sometimes found to have a deep blue color.)

The liver was sometimes congested, at other times than natural; the full bladder
full. A slight inflammatory edema was along the whole course of the intestines.

Where and Brunner’s glands remarkably developed; the mesenteric glands were enlarged and purple; a quantity of white fluid of the consistence of gelatine distorted the intestines; the mesenteric membrane was pulpy & presented at first

The bladder empty and contracted; the kidneys sometimes congested, sometimes containing in their parenchyma a Jesse-like fluid; sometimes apparently natural. No most singular phenomenon was often apparent, which was in many cases to great ex-
to deceive the nurses and those who watched
by the dead, the warmth by increasing
after death, and muscular contractions
of the limbs and even of the features occurring,
Curved lies speaks of the power of these
peculiarities in the following terms: "De pois
de la peau est moins intense que sur la car-
tavse que sur le vivant, ce qui tient en
grand partie à l'absence de cette substance
téméraire qui brûle la peau pendant
la dernière période de choléra; chez
plutôt que les autres la chaleur de toute
fois la chaleur du corps n'était mainte-
tante à peu près comme dans l'apoplexie."
Dr. Taylor says: "In some cases of death
from cholera in St. the body, which had been
moderately cold, was observed suddenly
to assume its warm state that the temper-
tature is stated to have risen some-
time after death as high as 89°, though
circulation & respiration had entirely
ceased. A case occurred at the
Royal Free Hospital where illustrated very
clearly the extent to which the muscular
movements might be carried on.
Jackson the Resident Surgeon was summoned by the nurse to see a patient, whom she described as having been laid out for dead in the usual manner. I accompanied him to the ward and found that she had indeed some cause for the suspicion. The patient, a young man, having raised the right arm across the chest, over the right leg being shifted, excited and excited, and the body being the same which is characteristic of the living state.

The cause of the returning heat was conjectured by some to be that the blood of the superficial capillaries was acted on by the air and that formation of carbonic acid and animal heat ensued. According to this theory, the circulation of various blood in all the vessels would be the real cause of the cold stage, and the disease might arise from some manner moist, subtle, and as yet defying analysis, floating in the atmosphere, whaled by the lungs, carried by the blood to the capillaries. It could not be that most important system a peculi
destructive effect, whereby their vitality is paralyzed, and their transmitting and secreting power impaired or destroyed, and those changes are not effected in the blood which are necessary for the and indispensable for the preservation of existence. This may be explained that coldness of the surface and internal congestion which are the significant signs of the disease; those dreadful symptoms which add to anguish to the patient's sufferings, the nerves being stimulated by this poisonous material of stimulating in their turn the muscles to excessive action; thus again may be accounted for the feebleness of the first action. No arterial blood coming to the left ventricle to stimulate it to its accustomed activity; thus also the coldness of the air expired, and its smaller proportion of carbonic acid retained with all its ill effects in the system. In this manner we may explain the diminish vomiting or better term discharges from the intestines; the thickened and tarry blood having passed...
with its by translation, itself remaining unexposed, digested, black, tar-like, and tending to decay.

Long ago Hunter contended that the cause of dissolution in yellow fever was "death of the blood"; and it is this "necrosia" or death of the blood which in this theory, the fatal effects of cholera are due; the death of necrosia itself being produced by a blood poison, which is the first and principal agent of the disease.

Some have contended that electricity was the agent; others again as Dr. Holland have attributed it to the flight of insects; by some, as Dr. Billing, it is laid to be an agent of a green colour, and caused by some species of malaria, while others think of constipation or particular state of the atmosphere as the cause.

That most of these may under certain conditions act as exciting causes is very probable. "Cause, says Dr. Collie, never acts simply or singly. The cause suffers not to produce disease." And L. J. remarks, "Disease occurs when the time of vital force, which tends to neutralise..."
causes of disturbance, is weaker than the acting cause of disturbance.” Now electricity may exist in three states in the body. 1st. in a state of equilibrium, common to all ponderable matter. 2nd. In a state of tension, giving to the body a positive condition, arising probably from the distance of the normal equilibrium by the process of corporatation & respiration. 3rd. in a state of current, a dynamical condition, arising from the distance of equilibrium by the union of carbon with oxygen in the capillary system, & other chemical processes in the body. (folding Bird) Such being the case with regard to organic life, it is plain that great variations occurring in the electrical conditions of the air must greatly influence the states of health & disease. The still unsettled point of “insect-entr” affords much ground for speculation. It is certain that during epidemic seasons, the flights of this kind are sometimes much greater than usual. During the year 1849, a species of aphis, having the appearance of a minute winged ant, prevailed most
extensively in England; and it has been a matter of frequent remark that those years which are most favorable to the development and propagation of insect life, are most unfavorable to human health. The malaria to which Dr. Billing attributes the disease may unquestionably have had great influence in spreading it widely and extensively in all sides. It first made its appearance at the commencement of a rainy season, so excessive that the fanucetic Delta was covered to a sheet of water. It has generally followed the course of navigable rivers, & that of many canals where seasonly any navigation was carried on which would have diffused it by human intercourse. We know how readily the human body is influenced by the quantity of aqueous vapors in the atmosphere and the fact that cholera attacks lofty as well as low situations is no proof that malignant influences are not at work, for as Dr. Williams comments, "It is not only marshy and low grounds that harbor malaria, although these are the situations commonly most favorable for its production, ..."
All that seems to be requisite is, the continued operation of the sun's heat on moisture, stagnant at or near the surface of the earth. And doubtless when that water contains or receives addition in being mixed with animal and vegetable impurities, the effects produced are more likely to be serious and fatal. That malaria is an exciting cause at times seems to be proved, I also by its having appeared at the season, when intermittent and intermittent prevail, and the fact that many cases of this latter disease from it even of every have been observed, which commenced with symptoms precisely similar to those of cholera. It becomes further the fact of a school at Clapham having been attacked with a disease much resembling cholera, from a bad drain or cesspool being opened and its contents thrown into a garden adjoining the school. In the fourth existing cause or constitution of the atmosphere which I have alluded to, it is to be remarked that such condition or conditions have perhaps existed previously without being distinctly felt by any outbreak of the disease. It
Cannot therefore be taken alone as an exact exciting cause, though it certainly has an influence combined with other circumstances in the reproduction and propagation of the disease. What Dr. Alison has remarked, that "it is perfectly ascertained on an extensive scale, in regard to the inhabitants of large and crowded cities, as compared with the rural population of the same climate, that their mortality is much greater, especially in early life, that the probability of life "very much less," holds good completely with respect to this disease; what the exact cause is, no one can tell. "Every natural phenomenon, every State, according to Liebig, has more than one determining condition. Every effect has several causes; and it is the simple search after the plurality of causes, it is the separative of the effects, which history and the modern form the ancient chemistry."
The same line of argument is applicable to the study of medicine, especially of such disorders as that now under consideration. Having spoken of these, the
presumed agent, and the exciting causes of the disease, I have briefly to mention the causes which seem to predispose to its occurrence. These may be both mental and bodily. Amongst the former are anxiety, depression, fear of the disease... The most prominent of the latter are... 1st Bad living... 

2nd Unwholesome diet or unripe fruits, cold drinks, the abuse of spirituous liquors; 3rd Unhealthy and bad ventilation; with reference to the influence of the proper supply of good water on the disease the following table of the relative mortality from Asiatic plague in different districts of the London water works may be added:

<table>
<thead>
<tr>
<th>District</th>
<th>Mortality per 10,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thames from Battersea &amp; the Blackfriars</td>
<td>202</td>
</tr>
<tr>
<td>Thames from Bermondsey</td>
<td>184</td>
</tr>
<tr>
<td>St. Olave's</td>
<td>183</td>
</tr>
<tr>
<td>Wandsworth</td>
<td>111</td>
</tr>
</tbody>
</table>

All these are supplied by the Thames below Battersea...
Mortality in Shinglebose, 17 in 10,000.

in Hampstead 8 in 10,000.

Both supplied by the Thames at Greenwich, &c. It is calculated that the drains, sinks
and closets of 2,200,000 people are
joined into the Thames, and that this
mass of fermenting pollution extends over
more than 2,000 acres in the inhabited part.

Again to illustrate the want of cleanliness as
a predisposing cause. I may remark that
at Berditschew out of 704 who were attacked
0.5% were Jews, remarkable for their dirty
habits. Dr. Pleinmann also, of St. Petersburg
records that of a village of 800 Jews, 700 died.
A fourth predisposing cause may be the Decline
of the Bowels or Diseasess of the Digestive Func-
tions; Fifth, Deficient clothing; Sixth
Arent of perspiration; Cold advanced Age
Seem to exert a peculiar influence.

Three females being much more liable than
the male part of the community; for instance
The Rev. C. J. Osborne found that at Bathurst
in 1829 the deaths were 354. Males 178. Females 208.
Out of 819 persons who died at Portsmouth 39% were
Males; 425 females. — Again youth.
Thus in a great measure to limit its fatality in the hospital ship the Rover out of 108 patients 57 were 60 and upwards, 32 were 50 years and upwards. Only 2 of all this number recovered. And it was estimated at Plymouth that out of 700 or 800 provisions they a large of persons who would soon from these habits, particularly liable to the diseases, only 3 were killed, probably in consequence of the protective influence of these commissariat joints.

It seems proper to notice here that cases of Cholera from Cholera murdered by its peculiar symptoms have been found to occur in the animal kingdom. A chimpanzee was attacked in the Zoological gardens at London in August 1849, with cramps, vomiting, rise in temperature, coldness of small pulse, opiate and chloroform were administered and he recovered in 3 days. "La Revue Médicale."

A case is recorded by Dr. Simpson of Man's chest of well marked Cholera in the
horse. The symptoms during life bore an exact resemblance to those which are shown in view, and the post-mortem appearances, especially the unconsolated tarry state of the blood, was most striking. During the last epidemic I injected the vein of two days' bulk in one case the vomited matter, in the other, the bile in water directly from cholera patients. In neither case was any permanent ill effect produced - probably if blood had been injected containing the elements of the disease, the result might have been of a different character.
Fifthly may be noticed The Symptoms including the Proper & Termination of the Disease.

These are of too definite and distinct a character that they cannot be confounded with those presented by any other similar affection. The premonitory symptoms are first a peculiar sense of uneasiness, a oppression about the epigastrie region, a state of burning in the ears; and a curious sensation referable to the spinal marrow, as if something was traversing the spine in the direction of the epigastrium which required a distinct effort and the horizontal position to prevent vomiting. Succeeding these symptoms, distresses, at first of faecal matter, afterwards becoming blood, and vomiting of a violent and very obstinate nature, ensue. The pulse becomes accelerated, and sometimes oppressed, and general distress and anxiety begin to be strongly experienced. Sperms of a terrifying nature supervene, affecting the succession
the muscles of the abdomen, of the chest -
nerve, and of the thoracic parietes,
and diaphragm; the extreme anguish
which their cramps entail upon the
sufferer is so great that he entreats
the bystanders to alleviate it by
constant friction, which in many
cases seems to give great relief.
The vomiting now becomes more
constant; the diarrhoea incessant.
The matter discharged consisting of
a peculiar whiteish - looking fluid to
which the term "rice - water" has been
generally applied. In this are seen
floating mucous and albuminous
threads. The respiration becomes more
and more hurried except at intervals
when in consequence of the thoracic
muscles being involved in the
spasms, it is occasionally suspended.
The air which is exhaled or expired be-
comes notably colder than usual, it
less carbonic acid given off by the
lungs than in the healthy state...
becoming gradually imperceptible; the heart's impulse scarcely felt, though occasional cardiac pains show that it is labouring to carry on the unsteady and disorganizing blood. The tongue becomes cold & leaden-colored. The voice assumes a husky tone, declining as the disease advances to a hoarse, small whisper, and to characteristic as to have been denominat the "Vox cholerae." The skin becomes cold, and blue, the eyes particularly being surrounded by a clayey, green, falling far back into the head, and the tears become opaque and fluid. The breath which in an ordinary state indicates 97° of the Thermometer sinks to as low as from 97 to 80 degrees. The hands seem to participate in the general disturbance of the system; the loose saliva, filling the gullet, ceasing to flow. If suction enters the patient, the gradually passes into a state of inflammatory fever; in
which the animal heat is restored, the
secretion re-established, but the danger
is not yet escaped. In this form almost
always assumes the typhoid type, and
though not very common in India, in
Europe it has been much more frequent,
and very fatal. In such cases, the
tongue becomes brown and coated; the
faucal labelling, the conjunctiva very
vascular; the bowels are acted upon
by medicine, discharge dark stools
in which bile is found. The urine
is yellow & retained so that it has
to be drawn off by the catheter. the
intellect becomes affected, the patient
not answering when couched as in
the cold stage; the breathing is
laboured. The laborious, and death
is generally preceded by coma more
or less defined. In those cases
in which this cold stage goes on
to a fatal result without any election
the skin becomes more livid, there
is constant irregularity of respiration
the attempts to vomit are useless.
the heart fails; hiccup occurs on, and the patient dies, faintly, prostrate and without complaint.

If blood is drawn during the course of the complaint it is seen to have a dark tarry appearance; it does not properly separate, but forms a loose conglutination, containing, according to le Caire, half the usual proportion of water, less fibrine, and no carbonic acid. The specific gravity was found by Dr. Parrot to be considerably increased; from 1.05, the healthy average to 1.075 or 1.080. The urine was found to be greater in the stage of collapse than in health, and in the consecutive fever the quantity became excessive; the urine acid followed the same relative proportion. The blood globules were increased in amount; the salt appeared to exist in increased quantities.

The evacuations according to Dr. O'Shaughnessy were consist of the liquid part of water, carbonate of lime and other salts deficient in the blood.
with no albumen or casein; the solid parts were threads of albumen and casein. Bowie considered them the fragments of the epithelium of the mucous mem-
brane of the intestines. They were always alkaline in reaction. The vomited matter exhibited an acid reaction.

What was thought to be the albumen of the liquid had been by Dr. MacLise, following up some ob-
servations of Audran, considered to be formed by mucous secreted in the stomach and in large quantities to thus alter it in quality. He names it "albuminum." He considers its presence in the secretions as evident proof of the
organizing transformations. Were this hypothesis fully proved, substances might be
presumed as chlorine


Patients treated at the Deadwoolit Hospital a similar existence of albumen in the urine, in all but one case. After the urine was suppressed, the first water passed afterwards was always albuminous, and accompanied by casts of the tubuli commixti, showing that the epithelium lining them had been thrown off. During the prevalence of the last epidemic, Mr. Britton and Mr. Swane found in the vomitus looks matter and in the secretion certain amebic bodies, considered by Mr. Brack to be a fungus or species of weako. These were shown by these gentlemen to exist also in the (condensed) atmosphere surrounding cholera patients, but investigations by other observers have failed to detect them in this medium. Dr. Bennett and Dr. Pettit found that such bodies did exist in the vomited matter and fever, but they found also co-existent with them other less equivocal vegetable bodies, so that these can hardly be regarded as the cause of the disease.
Lastly, I have to speak of the Treatment; which as might be expected from the deadly nature of the malady, has been infinitely various, and of the most opposite character in the hands of different practitioners.

Pierce says Dr. Watson, was the artillery of medicine more vigorously plied; richer were the troops, regular and volunteer, more assiduously active, and the more we remember that the absorbent surface is nearly inert, we can readily understand why remedies in other cases sufficing, are not in this disease exert their peculiar and specific influences. The following are some of the many remedial agents which have been adopted:

Carbonate of Soda — by Joss.
Magnesia — Millennium.
Sulphate of Soda — Magnes.
Sulphate of Iron — Lea of Warran.
Ferriic — Bote.
Charcoal — Evans.
Chloroform — Various writers.
Antifebrin — Bernard, Kei P.
Astringents, Acetate of Lead, Fever.
Saltpetre of Lime —— Opland
Salines ——— Stevens
Colonel (large doses) ——— Chambers
Small doses ——— Byrne
Injection of Salines

This list might be still much further extended without a full enumeration of the proposed remedies. But, as our knowledge of the disease has advanced (though the essential nature is still not understood) less trust has been put in single remedies, and greater confidence reposed in a more rational, and therefore varying mode of treatment.

The mode which was adopted by many practitioners during the last epidemic was a modification of the preceding ones, in order to suit the different stages as they successively occurred.

In the vindictive stage, the two principal indications are first, blood letting to relieve the laboured heart of part of the load to which it is striving in vain to give an adequate motion, and secondly, stimulants to raise the viscous energy...
is that by these influences on the circulation the blood which is stagnating in the internal vessels, and not undergoing its proper change in the capillaries may be more forcibly propelled and as it were equalized.

The bleeding to be beneficial should be early, and it is counter-indicated when that incipient stage is keeping on that of collapse; for then instead of restoring the balance of the circulation, it destroys the small degree of vital energy which still remains to the patient.

The stimuli may be of different kinds; those being preferable which can soonest be brought into action; the diffusible ones therefore as ammonia, Brandy, camphor. Or resort to the external I stimulate the best seem to be friction, rigorously and continuously applied—mustard to the stomach, and heat applied by bags of hot salt to the external parties. Its subsequent depressant effect seems to forbid the use of the warm bath, and it is an objection
To this purpose has been that by its co-operation the warm water at first produced is if not destroyed, at any rate not sufficiently maintained.

In the second stage of the disease, astringents may be conjured with the preceding uneasiness; if there has commenced fally and is co-existent with the other symptoms, acetate of lead with opium, cedrin, kine, chalk, have each been found useful. The vomiting can seldom be checked, and indeed with all the other means in full operation anything which could be given to alleviate it, would hardly have a chance of doing so; still if it is very violent, hydrochloric acid or carbonic acid in the form of effervescence may be employed.

The severe and painful spasms, so characteristic of this disease, are sometimes alleviated by the use of the stimuli before mentioned: thus, brine, vino, et al., in some cases gives great relief, and large doses of coloform seem to exert a
sedative influence upon their violent
and.

In the second or cold stage in acute is
frequently given to endeavour to cause the
slowing powers of life by the action of
vomiting. Cold air or nitrogen suddenly
applied affects the respiration, and is
sometimes of benefit, in producing more free
circulation through the lungs; dry air has been inhaled, as have been
the vapours of ammonia, carbolic
but with no permanent result.

Stimulant eminates have in some
instances proved useful. Colonel in
thirty grain doses and even more
has been very generally employed,
with the view of aiding the restoration
of secretion; it was given at the Dreadnought
in five grain doses every half hour.
Dr. St. Arnaud gave it in one grain doses
combined with a drop of carbolic every
five minutes, that the medicine might
be retained, 

It neither rejected from
the stomach, or hurried through the
bowels; very large quantities were given.
in this way without salivation being produced. Salvarsan passed through the chest, or from the neck to the diaphragm have been advantageously employed.

A little girl of 8 years old, at the Royal Free Hospital, was apparently dying; the breathing imperfect, the pulse imperceptible, the eyes closed, the mind unconscious, and a thermometer under the tongue indicating only a temperature of 82°. Shock therapy was passed at intervals for about a quarter of an hour. Immediately on the application being commenced, she opened her eyes, complained of pain, breathed more fully; the pulse became perceptible and the temperature rose to 92°. From this time she gradually rallied, was well in a few days. The saline injection has for a time rescued patients when they were at the brink of death.

My predecessor at the Royal Free Hospital injects saline into the veins of several patients with temporary benefit; he also injected the veins of several patients with blood poi
Health persons. The woman who was thus treated twice at the interval of 72 hours, lived a week; she recovered so far as to sit up in bed, and having unexpectedly obtained some fish from the nurse, she became comatose shortly after eating it, and died too rapidly.

It is very necessary to prevent patients in this stage lying in bed, sudden death often ensuing from the heart not being the power to propel the blood to the brain in the erect position.

The treatment of the febrile stage does not require much alteration from that pursued in febrile diseases generally. Simple diet, mild alteratives, local bleeding and blistering where necessary, with slight stimulants if the fever assumes a low form seem to be the principal medical measures indicated.

Much may be done in the way of Preventive Treatment. The more we by human means guard against epidemics, the more less liable we shall be to "pandemics." The Cholera, though dead, still speaks to us.
In warming times — its spirit may linger in its ashes, awaiting only an opportunity to rise, like the fabled phoenix, with power increased rather than diminished to do its dreadful work among us. How shall we prepare for its approach? Should it not be compulsory for the governing bodies of the country to adopt some if not all of the following means? This could either be managed by inspectors sent from the seat of government, or what they are preferable by gentlemen living in each city, town, & hamlet; men conversant with the localities, and therefore by experience adapted to devise and enforce proper sanitary arrangements. First by the removal of all improper matter from habitations, workshops, and places of public resort. To effect this great end an efficient drainage, and an adequate supply of pure water are absolutely necessary. Secondly by the destruction of nuisances from putrefying animal or vegetable matters, to which and foul ventilation, the light of the sun, paper
disinfecting agents as chlorine &c. must be strictly enforced. Thirdly, moderation in the use of ardent liquors, and personal and domiciliary cleanliness should be induced & encouraged. Fourthly, the separation of the sick when illness occurs by removing from the locality of the active epidemic, all persons except those whose presence is necessary; Fifthly, attention and inquiry into the circumstances and the story of the very poor with a view to relief; Secondly, and lastly, abolition of public houses, the establishment of baths & washhouses, the substitution of reading-rooms for drinking-rooms in the room of the beer shop and the tavern, and the blessings of education to teach them how more readily to escape all these scenes - your causes of disease; all these machinery for meeting the course of the destroyer should at once be set in motion.

And it is not only the duty, but the interest of the rich to attend to
these considerations. By the cooperation of all classes much may be done, and though the treatment of their dreadful disease may be conflicting, yet its nature, not yet understood, science can yet do much. Dr. Latham beautifully remarks that "The first maxim of all rational practice is that nature is supreme; the next, that nature is obscure. The end, whether good or bad, slavery or death, and every step to stage condition to it, are the unquestionable work of nature. But nature in all her powers and operations, allows herself to be led, directed, and controlled. This choice leads, and always will lead, to diversity of practice, which is no way disparaged, but rather tends to enrich & enlarge, the resources of our art." So with the disease we have been speaking of. Mysterious as it unquestionably is, its mysteries are beginning to be discovered. Dangerous as it is, its danger may often be turned & escaped.
And we may be permitted to look forward to the time, when by the aid of the advanced chemistry of the age, the light shed by discriminating pathological inquiry upon it, it will lose its violence and fatality, and the mortality of Cholera may by the combined exertions of the physician and the philanthropist, be checked and controlled, and in comparison with its horrors in past times, be amongst the things that were.