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ANTAGONISM
OF
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AND
DIPHTHERIA.

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BY

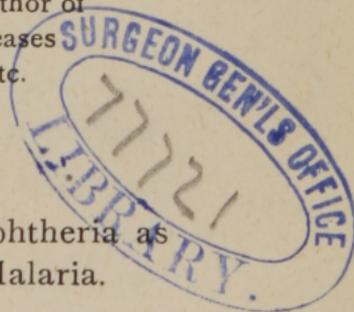
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rics and the Diseases of Women and Children in
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"Hysterology: A Treatise on the Diseases
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Alcohol is as antagonistic to Diphtheria as
Belladonna to Opium, or Quinia to Malaria.

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P R E F A C E.

I am induced to present this little work to the profession for several very good and sufficient reasons. Diphtheria prevails throughout the country, and numbers its victims by thousands. No remedy to stay its ravages, or to check even its onward march, has been found—albeit, chemistry, the microscope, and all other resources of rational medicine have been taxed to the utmost. At this juncture, when theory, exhausted in empty dreams, tries to comfort itself with the conclusion that diphtheria is a self-limited disease, and hence admits of little modification, other than that produced by a sustaining course of medication, I have thought it opportune to submit to the medical world certain empirical facts—facts that have been accumulating the past seventeen and a half years. These show, beyond cavil, that alcohol has, in my hands, proved itself, when most physicians have been losing every third or fourth case, not only a valuable medicine, but a

trustworthy antidote—one capable of saving ninety-five *per cent.* in severe epidemics. With me, this scourge, thus robbed of its terrors, causes no more anxiety than many common ailments. Of a certainty, I expect to succeed, unless the long delay in seeking advice has allowed the poison to do its work, and thus forestalled the specific virtues of this remedy of remedies.

These high pretensions, that cannot but seem absurd to one who has not submitted them to the crucial test of practice, have been sustained by many leading physicians of this city who have done me the honor to try my treatment. All have reduced the death-rate to a low figure, some have met with a success equal to mine, and three having been, *in propria persona*, a battlefield for alcohol and diphtheria, have kindly allowed me the privilege of using their names in a circular to our brethren in other parts of the country.

I must apologize for the dress in which I appear in public. Deeming it important, however, to make known, with the least loss of time practicable, the antidotal powers of alcohol in diph-

theria, I have been constrained, in view of the general distrust expressed of late in every plan of medication, to throw together, with some show of order, matter hitherto published. I trust, however, that my faulty exterior will not bar me an audience, seeing that the details of treatment—the all-absorbing subject in the face of disease—are fully and precisely given, under many and diverse conditions.

BROOKLYN, May, 1878.

ANTAGONISM

OF

Alcohol and Diphtheria.

CHAPTER I.

TREATMENT OF DIPHTHERIA, AS AFFIRMED IN '63,
AND RE-AFFIRMED IN '77.

The treatment of diphtheria* has, the last ten years, been so thoroughly and exhaustively discussed, that it would seem the height of folly, at this late day, to question the matured opinions of practitioners and writers the world over. Nevertheless, from the fatality of this deadly scourge, as it is universally considered, I am induced to offer my experience in a plan of medication which has, after a trial of more than fifteen years, been crowned with a success that throws every other, however pretentious, into the shade. To substantiate this bold statement, I shall appeal for proof to the records of the Board of Health of this city, a set of books as certain to dissipate groundless assumptions as to establish sterling

* *Buffalo Medical and Surgical Journal*, October, '77.

facts. The revelations of microscopy, the researches of chemistry, the flights of theory, and the deductions of reason are of little avail in the face of the enemy, when the urgent practical question—the empirical fact—what will cure the patient, waits a solution.

In '58 and '60, whilst employing the means then in vogue, I lost every third or fourth case—a frightful mortality, yet one many physicians bemoan even now; but immediately after instituting an opposite treatment, though the epidemic was at its worst, not more than one in twenty. This treatment, which I have since seen no reason to change, or even to modify in any essential particular, was, together with the cases presented in its support, published in the *Boston Medical and Surgical Journal*, February 5th, '63. In this article, reasoning from results to causes, I came to the conclusion that diphtheria is a disease of the blood—a disease tending to rapidly destroy the vitality of that fluid; that the exudation is secondary to this contamination—a local manifestation of a general dyscrasy; that the fever is symptomatic—the turmoil excited by the intrusion of a deadly agent; that alcohol counteracts, neutralizes, or destroys the poison, whatever it may be, acting, in fact, like a true antidote, if promptly and liberally given; that the membrane falls and does not reappear, directly the blood fails to offer the proper pabulum for its

growth; and that bark and iron are the only aids required, aside from substantial food, to conduct ninety-five *per centum* of all cases to a successful issue.

Acting on these principles from December, '60, to the conclusion of my report, January, '63, it appears that, of the twenty cases treated with brandy, quinine, and iron, I lost one only—a result so far surpassing what had been attained by others, that I hoped the profession would be induced to give these remedies a fair trial; but, as yet, this hope has not been realized. For this failure, it is easy to allege a sufficient reason. The misfortune of a name often clouds a writer's ideas, or, when these are fully grasped, ensures their prompt rejection.

Under ordinary conditions, alcohol is a stimulant; but in diphtheria it lacks this property—a quantity which would in health induce intoxication having no excitant effect: alcohol is thrown off in the breath; but in diphtheria, unless the dose is disproportionately large, no odor is perceptible until the disease begins to yield: alcohol is contraïndicated in acute attacks of fever, especially if attended with local inflammation; but in diphtheria the contrary holds true: alcohol is demanded, when the vascular excitement lessens and nervous energy flags, to support the vital forces in the effort to rally from the shock, and regain their supremacy; but in diphtheria the poison

has, at this stage of the disease, done its work so thoroughly that alcohol no longer, or but feebly, manifests its antidotal property.

Hence, from the more common action of alcohol, and the more common use to which it is applied, it is well-nigh impossible to gain a hearing, when, on the strength of clinical data alone, one asserts that alcohol in diphtheria is not a stimulant, but a febrifuge; is not an excitant, but a sedative; is not a tonic to support the strength, but an antidote to neutralize the poison; its full efficacy being shown at the outset of the disease when fever is high and inflammation acute. In fact, it is as much a specific for the diphtheritic poison as quinia for the malarial; each breaking up a special morbid process, and rendering a prompt return to health possible, through an unknown potency that has as yet defied the search of science. So, also, the analogy holds as to the prophylactic qualities of these two remedies; what is curative being equally preventive in each instance.

From the article published in the *Boston Medical and Surgical Journal*, February, '63, I will here make the following liberal extracts, inasmuch as it inculcates the therapeutical principles that have since, by a singularly small ratio of mortality, been notably vindicated; if, peradventure, success for a series of years is the touchstone by which to test medical doctrines:

“It requires a certain boldness to question long-cherished opinions, with which our minds have become indoctrinated, and, thenceforth, carry our investigations beyond the narrow circle that has hitherto bounded our mental horizon. Certain doctrines are held in regard to fever and inflammation, and, also, in regard to the remedies best calculated to reduce vascular action, and prevent or remove one of its results—an exudation of plastic lymph—that are so incorporated with what is known of disease as to give a coloring, a bias, to all the phenomena observed at the bedside. These doctrines ceased, long since, to be debatable; in fact, have assumed the position of principles and axioms in medicine. It appears absurd and irrational to ply a patient with brandy who has a high fever, hot skin, and rapid pulse, and whose throat is closed by inflamed glands, and covered with a plastic exudation—unerring symptoms of high action. Reason—*The only guide to a sound medical practice*—points out two very plain indications to be fulfilled—to wit, subdue the fever, and remove the inflammation with its attendant exudation. Hence two plans of treatment—the general and local—are in favor, and are enforced either singly or jointly: the one is carried out by antiphlogistics, such as purgatives, leeches, and mercurials, or by certain supposed specifics, such as the chlorate of potash; and the other by

a variety of astringent and caustic applications, the chief of which are alum, nitrate of silver, and nitric acid. At length I became so impressed with the powerlessness of these means to withstand the onward march of the disease, that I determined, by a bold and sudden change, to abandon this system of medication, and commence the liberal use of stimulants at the outset of the disease, however high the fever or inflamed the tonsils. With some hesitation and many misgivings, I made the first trial, supported by the reflection that this new course, however preposterous it might appear, could not increase the hazard surrounding the patient, or redound more to my mortification.

“Formerly, I entertained as great a dread of diphtheria as of Asiatic cholera; but, since the adoption of the stimulating treatment, I have gradually acquired a renewed confidence in remedies—a confidence so great, that I give place to the hope that this course of medication, when generally followed, will rob this frightful disease of much of its terror.

“A physician may resort to quinine and brandy in stimulating doses, at the outset of this disorder, with something of the assurance and reliance with which he meets an intermittent disease; and, according to my experience, a malignant miasmatic fever is no more amenable to the power of cinchona, than an equally malignant diphtheritic

state of the blood is to that of stimulants. In both diseases, he must strike boldly and promptly if he hopes for success. Every moment is valuable, and the hour for active interference has passed when prostration and sinking announce the constitutional powers tottering and subdued; for it is well known that the power of medicine is relative, not positive; is indirect, not inherent; and merely acts by calling out the reserved forces of the system.

“Within the last few years, the careful trial of different modes of treatment, whether rational or not, has done much to enlighten the profession as to the pathology of a number of diseases hitherto, and even now, I may say, too often treated with lowering remedies.

“In phthisis, though attended with local inflammation, the formation of pus and the destruction of tissue, blood-letting, blisters, antimony, iodine, confinement, and low diet have given place to nutrients, tonics, stimulants, air, exercise, and full diet, to the great gain of humanity.

“In scrofulosis, in its hydra-headed forms, though the patient may have all the appearances of robust health—be even full-blooded and well-developed—it has at last been discovered that inflammation is not to be met by the means usually enforced with signal success in constitutions untainted by this vice. The inflamed eyes peculiar to such subjects will,

however high the vascular excitement, be rendered worse by depletion, antiphlogistics, and mercurials, and will often show prompt amendment under the use of animal food, wine, and quinine. This is true of all the diseases pertaining to the scrofulous diathesis. They do not originate from external causes, but owe their rise and continuance to a defect in the vital organs.

“Hence it is that local treatment can be of no avail while the fountain is poisoned. On the contrary, when the blood, nerves, and each organ are brought up to the normal standard, and the vital elaborations are made to go on harmoniously, disease will disappear, or, if it still linger locally, will be benefited by appropriate applications. It is inconceivable, the amount of harm that has resulted from lowering remedies in scrofulous patients. Even at the present time, through a bias from a life-long struggle to subdue fever and inflammation, many of the profession are loth to forsake old, time-honored opinions, or to confess that facts are more valuable and trustworthy than reason. What but the slow, tedious schooling of facts taught the lesson, in cancer, malignant pustule, gangrene, sloughing ulceration, phagedæna, and the like, that the part affected is not more at fault than the entire system—is merely the site of a constitutional vice—and that these diseases are not to

be subdued by antiphlogistics or eradicated by caustics or the knife?

“In variola, rubeola, and scarlatina the hope is no longer entertained by the physician of cutting these diseases short by active interference, or of modifying materially their various stages; but, on the contrary, he confidently trusts to the natural powers whilst these are competent to the task, and only lends assistance when they show signs of giving way, and being unequal to withstanding or eliminating the *materies morbi*.

“In typhus and typhoid fevers—and, in fact, all others of a low type—experience has taught him that a reducing plan of treatment is not to be relied upon, and that he must anticipate the coming debility by a supporting regimen and medication, and begin to fortify the vital powers for the final struggle, when the circulation becomes poisoned and the nervous system prostrated.

“In this class of diseases the attention should not be occupied with incidental complications and symptomatic manifestations; but, rather, the effort should be made to reach the heart of the matter—the real disease—which will, if it be removed, carry with it the numerous attendants, and the common accessories following in its train.

“Rheumatism is another notable example of a disease that illustrates the principles of practice advocated above. Bleeding, calomel, purgatives,

and blisters long battled with the fugitive enemy with ill success. At length, by experiment, it was discovered that alkalies, by neutralizing the acid element in the blood, remove, so to speak, the very food that sustains and keeps alive the disorder.

“There cannot be a reasonable doubt that diphtheria belongs to this class of blood-diseases. Ostensibly, it is an ailment of the throat, attended with inflammation and the effusion of coagulable lymph. So, also, rheumatism presents the appearance of an inflammation of the ligamentous structures; scrofula of the glands and bones; syphilis, of the skin, mucous membrane, and periosteum; and variola, rubeola, and scarlatina, of the skin alone; whence, they have improperly been classed under the head of cutaneous diseases.

“If the free use of stimulants, in the beginning and height of the disorder, subdues the fever, removes the inflammation, causes the membrane to fall, prevents relapses, and, in a word, accomplishes a cure, at once rapid and permanent, in almost every case in which the treatment is commenced early, the unbiased observer must be forced to the conclusion that diphtheria is a disease of low action—ataxic—and that the inflammation attending it is, certainly, not idiopathic and active. This is further shown by the greater success following this mode of treatment than

any other; and by the significant fact that malignant cases thus usually escape the *dissolved* state of the blood, and that paralytic accidents are less frequent.

“*The cause of diphtheria* is an interesting theme for speculation. There need not be a material agency, a septic poison, in the atmosphere, as is the general opinion, which, received into the blood, multiplies itself like a ferment, and thus contaminates the entire circulating mass; for a change in the normal constituents of the air, or a variation in its electric condition, would render it less adapted to fulfil its part in the transformations constantly going on in the lungs, and would thus give rise to a defect in the vital elaborations of the blood. A faulty state of the atmosphere—one that imperfectly supplied the blood with the influence necessary to its constant renewal—would be scarcely felt by the strong and robust, but would tell with the most effect on those debilitated by depressing causes, and those endowed with little vital power. In my experience, the subjects of diphtheria are, almost universally, children; and when it attacks adults, those of little stamina are singled out, who at the time are suffering from unusual exhaustion. Of the former, those inheriting a scrofulous constitution, or other vicious state of the system, are the ones, as a rule, that are seized.

The child has not only to maintain the body *in statu quo*, like the adult, by the constant renewal of the worn-out materials, but also to provide for growth and increase.

“That the cause of diphtheria is not an animal or vegetable poison, but a state of the air that impairs the vitality of the blood, is further shown by the following considerations: diphtheria prevails in all seasons and climates, in primitive and miasmatic regions, in well-cleaned streets, among the better classes, and in courts and alleys, among the victims of want and vice; indeed, filth, poverty, vegetable and animal effluvia do not increase its virulence or cause its dissemination. It is not self-limited, has no fixed stages of increment and decline, may recur several times, does not attack indiscriminately, but, as a rule, singles out scrofulous children, or at least individuals whose constitutions are reduced and whose blood is impoverished.

“*The pathology of diphtheria* is neither elucidated by autopsies, nor by chemical or microscopical examinations. No special structures are invaded, or characteristic lesions discovered; only everywhere is found a dark, grumous blood, filling equally the veins and arteries, and stagnated in various organs. MM. Millard and Peter first pointed out that the blood was of a dirty brown color, resembling liquorice juice, or water containing a mixture of soot.

“ During life, there are conclusive proofs, in the malignant cases, of a poisoned, disorganized condition of the circulating fluid ; the dark, grumous blood oozing from the tonsils when roughly touched, the spontaneous hæmorrhages, the muscular weakness, the prostrated nerve-power, the clammy perspiration, the rapid, soft, and shaky pulse, the sphacelation in the fauces, the sequelæ—anæmia, paralysis, etc.—the gradual sinking of the patient, and the extinction of life without an effort at reaction or the slightest tokens of constitutional resistance. The evidences of a blood-contamination, equal to those seen in typhus, are infinitely greater than those presented in other diseases, now universally conceded to arise from this cause. Chemistry detects neither specific poison in the air, nor foreign element in the blood or material change in its constituents, when patients have died of this disease. The changes, and the agencies producing them, whatever they may be, are inappreciable by this means of investigation.

“ The enlarged vision afforded by the microscope, likewise, reveals no sensible alteration in the blood ; and the naked eye, which recognizes the fact of the transudation of the *liquor sanguinis*, and its concretion into a pseudo-membrane, gives us equal information with the most powerful glasses. The fibrillæ, granules, pus-cells, etc., that are found, are not distinctive ;

and the much-talked-of *algæ* are frequently seen on mucous surfaces when covered by morbid secretions. Their ova exist in the atmosphere at all times, but are not developed unless a favorable *nidus* is presented.

“*The stimulating treatment*, with a singular uniformity, whether in the acute or chronic stage—that of excitement, fever, and inflammation, or of prostration, rheumatism, or dropsy—had the same happy effect; and it was in all conditions that had a diphtheritic origin uninterruptedly followed, since I only regarded the causation, not its manifestations—the root of the evil, not its offshoots—and directed my efforts to the removal of a special state of the blood. This state of the blood, which is prone to occur in scrofulous children, or adults reduced by disease or of feeble constitutions, in a certain endemic condition of the atmosphere, is marked by a diminished vital power, which being exalted by stimulants, the symptoms are checked, the inflammation subdued, the membrane removed, a rapid recovery effected, and relapses prevented. In other words, this plan of medication is radical, strikes at the heart of the trouble; whereas, most others that have been proposed are but an ineffectual warfare against symptoms. The blood, which is similarly affected in the mild or severe cases, in the first or later stages, only

differing in the degree of its dissolution, alone claims our attention. Against this condition, before the disintegration is irreparable, I bring to bear the most powerful means at command to buoy up the constitutional powers, and sustain the activity and energy of each function. The first link in this morbid chain being this retrograde movement in the vitality of the blood, when this is checked, fever, inflammation, hæmorrhage, exudation, collapse, paralysis, dropsy, etc., disappear almost magically, from the simple fact that the cause has been rendered null and inoperative, and the prime pathological change removed.

“ Of the remedies that have been employed in diphtheria, two only have proved themselves in my hands worthy of confidence, with the exception, in the chronic stage, in favor of the salts of iron. These two remedies—alcohol, and cinchona in one of its forms—are administered in such doses and at such intervals as to secure one effect—the fullest stimulation of the nervous and vascular systems. Either, singly, may suffice when the vital force needs but slight aid to maintain the integrity of the blood; but the two united have more than a double power, and call out the greatest possible amount of resistance, since the nerve-centres and blood-vessels—the great life-factors—are exalted to the highest point. Alcoholic liquors, when given in such

quantities and at such intervals as to occasion and keep up a steady but not excessive excitation, not only quicken the functional offices of each organ, but act more especially on the nervous and vascular systems. They bring out the latent powers, arousing them when dormant, and freeing them when oppressed by a load of morbid influences; and thus give, for the time being, the greatest energy to the entire organism. Herein, according to the views of many therapeutists, alone consists the value of this class of stimulants in any disease. The patient lives over the crisis, or the poison is spent or eliminated; and thus recovery becomes possible.

“ This is but a partial estimate of the remedial action of alcohol, which not only produces the effects just mentioned, but others of much greater importance in the present disease—the increased vitality of the blood itself. It is well known that the habitual use of spiritous beverages augments the blood-making process, renders the blood richer in all of its important constituents—the red globules, albumen, and fibrin—and of a greater crasis; by which means there arises an excess of organizable material, that often occasions inflammatory diseases in *bon vivants*. This condition is the opposite to that existing in the diphtheritic subject, whose blood has invariably been rendered poor by exhausting disease, or impoverished by the demands of increase and growth, as

in the instance of children. These causes are intensified and rendered operative by a scrofulous or syphilitic taint.

“Therefore, from clinical observations and therapeutical deductions, I arrive at the practical conclusion that alcohol is not only a stimulant to the system at large, but also to the blood itself, quickening its vital elaborations, and increasing its vital status, through which a direct barrier is thrown in the way of the disease. In other words, the results produced by the disease, and by the alcohol in the blood, being directly opposite, neutralize each other; and thus the stimulant assumes in my eyes the position of a true remedy, a trustworthy antidote. Hence its medicinal power being not only remedial but prophylactic, it will prevent the extension of diphtheria in the other members of the family, as well as cure the one affected. This conclusion is a necessary sequence, if the pathology of diphtheria and the *modus operandi* of alcohol have been correctly appreciated.

“In malignant cases of diphtheria, it is advisable to invoke the aid of a co-operating remedy—of one, like quinia, that particularly excites the great ganglionic nerve-centres; by which means a maximum of power is attained, and stimulation carried to the highest possible degree. The various preparations of the cinchona bark fulfil this indication; and, when pushed to

the extent of causing *tinnitus aurium*, are the most potent nerve-stimulants. Their efficacy is shown in all diseases when the innervation is weakened, disordered, or perverted; in fevers from malaria, in fevers from a blood-poison, and in a variety of morbid conditions, attended with an exhausted or defective nervous energy. As a tenderness of the gums is a mark of the saturation of the system with a mercurial, so the ringing in the ears indicates that the brain is fully under the influence of cinchona. Both it and the alcoholic stimulant, whether used singly or jointly, should be given with regularity, and in sufficient doses to obtain their full effects; and then the latter, in a lessened quantity, continued for two or more weeks after the disappearance of the disease and its sequelæ. From the outset to a permanent restoration to health, one or perhaps both of these remedies are to be continuously administered.

“ In the more tedious cases that retain a hæmorrhagic tendency, the substitution of a sesquisalt of iron for the cinchona might, for a time, be advisable, when the peculiar effect of the latter on the brain had been attained. These salts of iron, like the alcohol, increase the crisis and coagulability of the blood, as I have experienced in several instances of internal hæmorrhage; but they affect the body of the blood too slowly to be a trustworthy reliance in acute cases. Their ac-

tion would be slight, short of two or three days; whereas the progress of diphtheria brooks no delay. Indeed, one of my cases was attacked with the disease, although the persulphate of iron, in free doses, had been in use for hæmoptysis for more than forty-eight hours. At least fifteen drops of the muriated tincture, or five drops of the solution of the chloride or persulphate of iron, should be administered every third or fourth hour whenever the physician wishes to produce this peculiar change in the blood; but in chronic cases, with more time at his disposal, the dose may be less, since usually the main object is now to remedy the anæmia.

“ Most writers insist strongly on the importance of giving large quantities of animal broths to sustain the strength of the patient, and thus enable him to ride out the violence of the disorder. This, as a medicinal means, cannot but be erroneous in the early stages, since most of the patients are taken while eating heartily of animal food, and enjoying their usual health. It is improbable that nourishment, however concentrated, which did not prevent the accession of a disease whilst the digestion was vigorous, would cure it when digestion, assimilation, and nutrition were completely destroyed. The change of food into the living structures is something more than its ingestion into the stomach, or its absorption into the blood-vessels; and nutri-

ment, unappropriated, can be only an incumbrance—a foreign element—which will be carried off by the kidneys with the effete matters. Most of my patients took little or no nourishment before convalescing, when it was ordered for the same reasons that we order it in other ailments.

“It is important to avoid close, hot, and badly-ventilated rooms, and secure a free circulation of air. As soon as practicable, the patient should be taken out of doors, and no fear need be entertained of *catching cold*; the disease having no analogy with tonsilitis, pharyngitis, or any other mucous inflammation whatsoever.”

Since writing the above, I have come to rely more and more confidently on alcohol in some one of its many forms, as the remedy *par excellence*, not only for diphtheria, but also for all diseases with which it is complicated; for example, croup, scarlatina, pneumonia, and albuminuria, and I might say, perhaps, gastritis and meningitis. In fact, diphtheria so contaminates the circulation that recovery is scarcely possible in slighter ailments than these, unless this, the major disease, which overrides all else, is promptly attacked by the only agent that will neutralize its venom and effectually check blood-degeneration. This being done, the case is usually so simplified as speedily to terminate in recovery with little farther aid from art. Often, indeed,

these several complications are simply varied expressions of the diphtheritic poison—signs of a general infection of the system, that demand even more urgently the use of stimulants and tonics in full doses.

Still more, diphtheria makes a decided impress, when generally prevalent in a community, on all other diseases, by imparting a low type that forbids depressing medication and demands early stimulation. Antimony, ipecacuanha, and hot baths should in croup soon give place to brandy, quinine, and good food; immediately, if the fauces appear at all suspicious, and shortly, if the reducing plan fails to subdue the rough, rasping cough. Thus the formation of the croupous membrane, which, doubtless, in a certain epidemic state of the air is always of a diphtheritic nature, may be forestalled. So, also, in cases of mucous, follicular, and glandular inflammation of the tonsils, the alcoholic treatment heads off the enemy, should it lie in ambush, and more certainly than any other ensures a prompt and satisfactory recovery.

The exudation fully declaring itself, whatever may precede or attend it, the alcohol is to be implicitly relied upon to the exclusion of all else, unless the sulphate of quinia be an exception, and given with the same precision as is requisite to the proper administration of any other important medicine. The conditions of success must be

observed scrupulously, as otherwise the alcohol may be robbed of its specific virtues, and the contamination of the blood go on unchecked. Whatever makes a call on the nerves, and lessens their tone like cathartics, emetics, and foul air; and whatever deteriorates the blood, and impairs its crasis like mercurials, alkalies, and poor food, is to be carefully avoided.

Consequently, the patient should be in bed, the room cool and well ventilated, evacuants interdicted, the secretions undisturbed, and the fever, local symptoms, or other accessory conditions disregarded. The one indication alone obtains—to wit, the introduction, as promptly as practicable, of a sufficient quantity of alcohol into the circulation to counteract the effects of the poison, and prevent morbid changes in the blood. The more speedy the resort to the antidote, the more speedy the cure, a day or two being often sufficient to restore the patient to his usual health; but, if the alcohol be held in reserve until the fever is allayed and the system prepared for stimulants, it will be shorn of its potency, as now the damage has been done and there is no vitality left to respond, though the stomach were flooded with alcohol and stuffed with food.

The administration of alcohol, therefore, at the inception of the disease, and in a sufficient quantity to prevent the peculiar fermentation in the

blood induced by the diphtheritic poison, is necessary to the full play of the specific virtues of the remedy ; but, on the contrary, that of quinia at a later stage and in a moderate dose to sustain the nerve-centres and arouse the latent energies of the system. Nevertheless, to intensify the power of alcohol by imparting through the nerves more vitality to the blood, it is safer in bad cases to inaugurate the treatment with both, and, in this way, anticipate the depression that soon follows the appearance of the membrane.

The office of iron is much inferior to that of quinia. It is not to fight the battle, but to complete the victory ; not to defend the citadel, but to rebuild its shattered walls ; and yet, in order to remove every evidence of the terrible struggle, and restore the vital forces to their wonted supremacy, the aid of alcohol is needed more or less constantly.

CHAPTER II.

PAPER READ BEFORE KINGS COUNTY MEDICAL SOCIETY, OCTOBER, '77.

The re-appearance of diphtheria, the Winter of '73 and '74, in an epidemic form and with its old-time fatality, excited great apprehension in the community and much discussion in the profession. Eventually, as the disease extended in area and increased in severity, a meeting of this Society was called to consider the subject, and interchange views as to the means the best fitted to meet and repulse the enemy. At that meeting, I had the honor to open the debate on the treatment. My opinions, markedly divergent from those expressed by others—opinions published as early as '63 in the *Boston Medical and Surgical Journal*—failed of acceptance, met with adverse criticism, and fell to the level of all clinical facts in the face of rational medicine. How preposterous for one man to pit a few empirical observations of his against doctrines settled as long ago as the days of Cullen! What! is the contest to be fought over again with a modern John Brown? Is the caution to avoid stimulants in fever and inflammation to be cast to the winds? It is contrary to reason and common sense. Such a practice, surely, would but add fuel to the flames. Moreover, the claim of nineteen recov-

eries in twenty consecutive cases, as reported in the *Boston Journal*, is easily explained: a physician often has a run of mild cases—a fact notably observable in scarlatina.

The object of this paper is to present additional and more decisive clinical data, such as it will be difficult to explain away, or otherwise account for than by conceding a direct and positive antagonism between alcohol and diphtheria. I am now prepared not only to repeat the assertion, formerly made to this Society—that a physician, when called early, ought not to lose more than one in twenty cases—but also to announce the still more startling fact, that double, yea! quadruple, that number has since then been, consecutively, brought to a successful issue. In fact, diphtheria is, when attacked boldly at the outset, more amenable to treatment than many common diseases; and yet the fatality under prevalent modes of practice is as great, almost, as that of unmodified small-pox.

I propose calling your attention to the subject before us this evening under the following heads:

- 1st. The pathology and treatment.
- 2d. The histories of typical cases.
- 3d. The reports of cases, and the certificates of deaths.
- 4th. The preventive measures.

I. THE PATHOLOGY AND TREATMENT.

My views on the pathology and treatment of diphtheria, inasmuch as they have hitherto been presented to the Society, I will simply recapitulate in an abstract form: Diphtheria first appeared in this country in the year 1858. Its essential features are totally distinct from those characterizing all previous throat-distempers. The remote cause of the disease may be the multiplication of germs, animal or vegetable, on an abraded point in the fauces, and their transit thence through the lymphatics and blood-vessels to every part of the body. Its clinical history, however, better accords with the action of some subtle agency, which, pervading the air universally, impairs the vital status of the circulation through the lungs. In an epidemic, all are affected by the morbid agent, but a few only yield to it. Mature, vigorous persons have vitality enough to resist the disease. Children and weakly adults are its usual subjects.

To this general and predisposing cause, there is, almost always, superadded a local and direct exciting cause, such as defective exercise, improper diet, dark rooms, damp houses, imperfect ventilation, and poisonous emanations from decomposing filth in privies, cesspools, sewer-pipes, etc. To such agencies, the strongest constitution will soon succumb.

The blood being deteriorated, its crasis is impaired and its vitality lowered; and then the sympathetic nerves, failing to receive due stimulus, waver in their efforts to carry on the animal functions. Thus the mainspring of life loses the tension that keeps the whole mechanism in motion.

The exudation is a symptom only—a sign of the degeneration of the blood and the semi-paralysis of the sympathetic nerves. The exudation may be slight, or even absent altogether, and yet the most serious sequelæ supervene.

All local treatment is worse than useless. It exhausts the nerve-force and induces greater injection of the blood-vessels, thus favoring the exudation.

Alcohol neutralizes the diphtheritic poison, sets free the nerves of animal life, subdues the fever and inflammation, destroys the pabulum that sustains the membrane, cuts short the disease, conquers its sequelæ, and shields other members of the family from an attack. Upon the subsidence of the fever, as is usually the case in from twenty-four to thirty-six hours, a purulent secretion begins to loosen the membrane, and soon thereafter to detach it in flaky, ragged fragments. This process may take place, and recovery be possible, even when the larynx and trachea are implicated. The membrane is seldom renewed, when this secretion is maintained by a

steady use of the remedy. Alcohol is as antagonistic to diphtheria as belladonna to opium, or quinia to malaria. Like any other antidote, it must be given promptly at the outset, as otherwise its potency will be lessened, perhaps lost altogether.

Alcohol does not act as a stimulant, nor induce any of its ordinary effects. Enough may be given to cause profound intoxication in health, and yet there exist no signs of excitement or odor in the breath. Hence, at a late stage of the disease, it is of little avail.

Should the administration of alcohol anticipate grave symptoms by thirty-six hours, recovery is assured; should the epiglottis be implicated, a croupy cough present, or the blood much contaminated, recovery is possible; but should the larynx be involved so as to impede the aëration of the blood, recovery is improbable, though, even then, the secretion of pus may detach, disintegrate, and supplant the membrane.

All cases of croup, on the failure of the usual remedies to subdue the harsh, rasping cough, should have alcohol added to the treatment; all cases of scarlatina, on the appearance of a membranous patch in the fauces, should be considered as diphtheria; all diseases associated with diphtheria, inasmuch as its presence casts a baleful shadow over every other morbid condition, should be disregarded, or, at least, receive sec-

ondary attention only ; all the sequelæ of diphtheria—paralysis, albuminuria, hæmorrhage, anæmia, etc., etc.—should, whatever else might be demanded, be subjected to this all-potent remedy.

Quinia is an efficient ally to alcohol. It energizes the ganglionic nervous system—a member of the vital forces not less important than the vascular—and thus enables the organism to right itself and resume its functions.

Iron plays an unimportant part at first ; but later, when the diphtheritic poison has been neutralized, it restores color to the blood, imparts force to the nerves, and awakens active nutrition—matters of no light moment in most cases. At an early day, even food and other means to support nature are of slender advantage ; but when alcohol and quinine have tempered the violence of the symptoms, they are imperatively demanded.

The power of alcohol and quinine to prevent blood-degeneration and nerve-exhaustion, depends on fresh air, bodily rest, mental quietude, and disuse of lowering medicines. So, also, the power of iron and food to restore the fluids and solids to their normal standard, is only operative by observing the same general caution as to impure air, active exertion, and heroic treatment of individual conditions.

Alcohol and quinine have no greater power to cure than to prevent diphtheria, provided they

are given promptly and continuously. With thorough ventilation, they are all that is needed to purify a room or a house, unless there exist some extraneous source of infection demanding special attention.

II. THE HISTORIES OF TYPICAL CASES.

Alcohol inefficient as a stimulant—efficient as a preventive.

C. B., nearly six years of age, had been ailing a week with what the parents supposed to be the mumps, when I was called. The child met me in the hall, and presented no indications of serious illness. On inspection, the entire pharynx was found covered with a thin layer of membrane. The fetor was slight, the inflammation trivial, and the dysphagia scarcely noticeable. Externally, the appearance simulated parotitis, only the swelling was lower and broader, and had greater hardness and less sensibility. The child was put into bed, and a teaspoonful of whiskey, with a third of a grain of quinine, given every hour. As the symptoms became more grave, the dose was gradually increased to double this quantity. The treatment did not seem to have the slightest effect. The child died on the seventh day from blood-poisoning. The parents and five other children, one of whom had Pott's disease of the spine, took whiskey and quinine four times a day, in doses varying from

one to six drachms. All escaped except the eldest daughter, who had on one tonsil a small, membranous patch that fell off in two days' time.

*Abortive action of alcohol—Diphtheria without exudation—
Danger of sewer-gas.*

A little girl, three years of age, recovered from a severe attack of diphtheria in twelve days, by the use, almost exclusively, of whiskey. Having been much petted, it was impossible to induce her to take the quinine very frequently. The parents, another child, and two servants escaped by the virtues of the antidote. The aunt, a person of strong temperance proclivities, who was in constant attendance on the child, refused to follow my prescription. When the child was convalescent, she began to experience throat-symptoms, to loathe food, and to suffer from weakness. Her pulse was feeble, and her extremities were cold. Her system seemed laboring under some powerfully-depressing agent, and yet the local signs of diphtheria were absent. The fauces had a diffuse, deep-colored redness, and the tonsils secreted a tenacious, muco-purulent matter, that was readily washed away by a gargle.

A few days after the termination of my attendance on the child, I was sent for to see the aunt. The local symptoms had subsided, but the

general had become more pronounced. There were present the most dangerous sequelæ of blood-poisoning—feebleness of the heart's impulse, and sluggishness of the ganglionic nerves. She was directed to take whiskey and quinine, to use nourishing food, and to keep her room. As soon as the appetite returned, the nutrition improved, the blood gained volume, and the nerves sent force to the organs, iron was prescribed and exercise in the open air enforced. It was three months or more before this patient regained her usual health.

The sickness in this family began in March of last year, and was traced to sewer-gas as the exciting cause. This being prevented from entering the house by running a ventilator from the main trap in the water-closet to the kitchen flue of the adjoining house, the recurrence of diphtheria has been obviated, though other precaution, save the use of alcohol and quinine, was not taken. The health of the family has since been excellent.

Clinical observations, similar to those just detailed, made in another family.

This family consisted of the grandmother, the mother, two children—a girl of eleven and a boy of six years of age—and two servants. The mother and the two children slept in the room adjacent to the bath-room, where the odor was

so offensive as to lead to the constant employment of disinfectants.

The girl was attacked with diphtheria the 24th of January, and the boy the 11th of February, of last year.

The girl had a very severe attack; primarily, from the poisoning of the blood, and, secondarily, from the swelling and elongation of the uvula. The membrane was slow in falling; and then, as she began to sit up, a paralytic affection of the pharyngeal muscles showed itself. Nevertheless, in ten weeks, she regained her usual health.

The boy's symptoms were light compared with those of his sister, and soon subsided. From some cause--perhaps neglect to continue his medicine a sufficient length of time, or fault in not attending to the ventilation of the soil-pipe immediately--the boy was attacked again the 23d of February. This attack was much less severe than the first. His recovery was subsequently prompt and complete.

As the boy improved, the grandmother began to show signs of the secondary effects of diphtheria, although at no time had there been the slightest deposit in the fauces. The mucous membrane had been merely dry, glazed, and injected. The prostration had come on so gradually, that I was surprised, when my attention was called to her, to find the extremities cold, and the pulse small and feeble. Forgetting her-

self in her anxiety for the children, she had neglected to take the preventive medicine, except at rare intervals. Her daughter, however, had observed proper precaution, and escaped.

The treatment of this case consisted, at first, of rest in bed, and the use of whiskey and quinine as medicine, and of lime-water and milk as food ; and then, as her strength returned, of gentle exercise in the open air, and the addition of iron, meat, and vegetables to the programme. My attendance on the grandmother extended from the 27th of March to the 1st of May, when the family left for the country. In each case, the recovery was perfect. Meanwhile, the joints of the soil-pipe had been examined, and a ventilator four inches in diameter carried from the two water-closets to the roof of the house. Since this was done, no odor has been perceptible, or any form of filth-disease present.

Secondary results of diphtheria without exudation.

A gentleman, seventy years of age, was seized with creeping chills and flying rheumatic pains. He thought he had taken cold, and treated himself, as had been his wont for similar attacks, on the starving plan. Having on a previous occasion examined his urine, and found it heavily laden with phosphates, I was also led to the same conclusion, and induced to prescribe Rochelle salt, and to direct an unstimulating diet.

To my surprise, he rapidly grew worse. He was indifferent to food, had cold hands and a purple color under the nails, and manifested no inclination to leave the lounge, except to change, as his posture became irksome, for a few minutes to an arm-chair. This prostration, coupled with his years, gave me serious apprehensions as to the final issue. There was no disease of the heart or of the fauces to be detected. As to the kidneys, they were excluded by a recent examination of the urine.

In a day or two, a gouty joint of his right foot began to be painful; and, directly, all the toes of the left foot, which had never before been affected, became red and swollen. Whilst this gouty inflammation was showing itself in the feet, an ulcer with deep-red, elevated margins appeared on the right tonsil. The rest of the gland was intact.

At the first indications of increasing debility, whiskey and quinine were given cautiously as a stimulant and tonic; and then, when it was found that the feet gradually improved under this treatment, the amount and frequency of the dose were systematically carried up to the diphtheria-level. Meanwhile, nourishment was not neglected.

What was singular—a fact that gave me the clue to the real nature of the disease—the trouble in the feet left almost as quickly as it appeared, although little or no impression had been made

on the symptoms of nerve-exhaustion. Besides, the ulcer soon lost its red, prominent boundaries, and appeared not unlike those so often seen on the mucous membranes. At this stage, the muriated tincture of iron was added to the whiskey and quinine.

Notwithstanding the serious aspect of this case, convalescence was so far established at the end of three weeks, that the patient was permitted to leave the city for his farm in Fairfield, Conn. Here, his medicine being materially aided by country air and exercise in the garden, he improved steadily, and in two months regained his usual vigor. At present, his health is better than it was before his illness.

If this was not a case of diphtheria—one of great gravity—I am at a loss what name to apply to his disease. One other strongly confirmatory symptom I should have mentioned: at an early period of the attack, the patient had a fit of strangulation on taking the first swallow of a glass of milk. Subsequently, he was obliged to be cautious and methodical whenever he drank fluids.

Diphtheria with pneumonia.

A gentleman who had for many years been superintendent of a large brass manufactory, where his nerves had at length become so shattered by the roar of machinery and the reverberation of metal that he was about retiring to a

farm in Connecticut, was taken down with pneumonia and diphtheria simultaneously. Brandy and quinine carried him quickly and safely through these diseases; whereupon, the country air, imparting tone to the nervous system, restored the full vigor of former years.

The membrane extending to larynx, trachea, and bronchi.

A child seventeen months old, badly nourished, and subjected to the adverse conditions of the back basement of a tenement house, came under my care the third day of its illness. The exudation covered the fauces and filled the nostrils. The voice was extinct, the head thrown back, and the inspiration laborious and whistling. I held out no hopes to the parents of recovery, but told them that their only chance was to give, as long as the child could swallow, the following prescription:

℞ Quiniæ sulp. . . . gr. vi.
 Acid sulp. aromat. . . qtt. xx.
 Sp. frumenti. . . . ℥ i.
 Aq. fontanæ . . . ℥ ij. M.

S. A teaspoonful every hour and a half in water.

This was given singly and uninterruptedly until convalescence was established, when the whiskey alone was relied upon.

On the third day of my attendance, as the membranous secretion gave place to a purulent

one and the respiration improved, the ears became filled with the same deposit, and the cervical glands enlarged by a low form of inflammation. Two of these glands quickly suppurated, and were lanced. In the meantime the exudation having disappeared, the medicine was given at longer intervals, and lime-water and condensed milk substituted for the mother's milk, which was watery and insufficient.

In a day or two, the child began to struggle for breath as in membranous croup, when the quinine and whiskey were re-ordered as at first. The effect was a copious purulent secretion, a disintegration of the membrane, and the relaxation of the spasm. As soon, however, as this danger was past, a graver one, if possible, presented itself—the extension of the exudation to the bronchial tubes. The child did not expand its chest, had a livid, bronzed look, was bathed in a clammy, profuse perspiration, and felt as cold as a piece of marble.

I directed an emetic of ipecacuanha, sinapisms to the chest, dry warmth to the extremities, and a continuance of the prescription. The emesis, bringing up a large amount of muco-purulent matter, gave instant relief. Afterwards, the child vomited once or twice a day spontaneously. My attendance extended from February 19th to March 11th; but, ten days before the last date, the recovery was assured. This was not retarded or marred by any secondary trouble whatever.

Croup, scarlatina, and diphtheria.

A boy three years old was taken in the evening with croup. At first emetic, and then nauseating doses of ipecacuanha were given, but in the morning, to head off any lurking tendency there might be to the membranous form, fifteen drops of whiskey every two hours. The third day, the mother had a small diphtheritic patch on one tonsil. Two teaspoonfuls of whiskey and one grain each of quinoidine and sulphate of cinchonia were directed every two hours. The whiskey ordered for the boy was now given to his brother, two years younger, in ten-drop doses. On the fourth day, the first, and on the eleventh the second son, were attacked with scarlatina in a mild form. The alcoholic treatment was followed without addition until convalescence was established. On the twelfth day, the daughter, twenty-one years of age, the only remaining member of the family, was attacked with a raging fever, intense headache, and membranous inflammation of both tonsils. In her case, the same medicines were prescribed as those taken by the mother. All recovered promptly and suffered from no secondary disorder, except the mother, who had, some ten days after the fall of the membrane, a dimness of vision that forbade reading, sewing, or other continuous application of the eyes. This symptom necessitated a return to the original treatment for a couple of weeks.

Diphtheria and scarlatina in the same subject.

A boy, six years of age, was taken with diphtheritic sore throat; and, though the local disease remained much the same, he rapidly grew worse. His blood seemed saturated with the poison—as shown by the stomach rejecting all food and drink, by the heart acting feebly and irregularly, by the extremities being cold and shrivelled, and the skin having a dusky, sodden look. At first one, and then two teaspoonfuls of brandy were given every two hours; but, soon, the larger dose every hour. Food, in any form, would not remain on the stomach, and quinine, promptly rejected, induced a retching that was slow to subside. The brandy, only tolerated in divided doses, had to be often repeated to make good the loss. On the third day, there was a typhus-like fever, lividity of the surface, oppression of the brain, muttering delirium, and a quick, feeble pulse. On the fourth day, scarlatina made its appearance. The eruption, save mottled blotches on the face, was confined to the trunk, and had a deep raspberry hue. As the symptoms assumed greater gravity, the brandy was given in three-drachm doses every hour, and aided, as far as the stomach would permit, by quinine, and lime-water and milk. At the advent of the eruption, the membrane began to spread over the fauces and to extend up the posterior nares, and, at its decline, to be detached in

putrid flakes and discharged in purulent sputa. The active treatment extended over two weeks, and resulted, without accident, in a speedy and perfect recovery.

Diphtheria and scarlatina in the same house.

A girl, nine and a half years old, deficient in constitutional force, weakened by too rapid growth, and afflicted with lateral curvature of the spine, was taken with diphtheria. The exudation on the third day covered the fauces, filled the nostrils, and extended along the roof of the mouth. The symptoms became more and more typhoid, and the putrescence more and more pronounced. Food and drink were not tolerated, quinia induced violent retching, and brandy was vomited unless given in small quantities. The case seemed desperate, as it presented all the signs of malignancy. Beginning at first with smaller doses, the brandy was soon increased to four drachms the hour, and when rejected was made good. As the stomach became more tractable, lime-water and milk, scalded in a thin decoction of farina, was given for nourishment; as the disease began to yield, quinia was administered in suppositories; and, as the membrane lost its hold and was supplanted by a purulent secretion, the tincture of iron, in small and frequent doses, was conjoined with the brandy. In two weeks, convalescence was fully inaugurated;

and in three, when the local disease was completely subdued, a semi-paralytic state of the heart showed itself, and necessitated the removal of pillows and a rigid enforcement of the horizontal posture. Eventually she was restored to her usual health without a drawback, excepting a discharge from the right ear.

On the fifth day of this patient's illness, two of her younger sisters were attacked with scarlatina. The whiskey which they, together with the other members of the family, had been taking as a prophylactic, was now continued as a medicine. The only addition was a diaphoretic mixture. They passed through the fever in the most satisfactory manner, it being neither aggravated by complications nor prolonged by secondary disorders. The others in the house, some twelve in number, exclusive of the servants, escaped by the virtues of the antidote, though the scraping of walls, the burning of clothes, the tearing up of carpets, etc., were omitted.

Abortive power of alcohol.

I was called on a Sunday evening by my friend, Dr. —, to see a lady whose child had died the morning previous of diphtheria. She had held the child most of the time of its illness, and kissed it repeatedly and frantically on the lips as putrescent matter flowed from them in its last moments. Friday and Saturday she had

had an exudation of moderate extent in the fauces; but now she had, in addition, a diffused, intumescence and induration of the neck. Seeing that the patient had inhaled the child's breath for six days, had had patches on both tonsils for two, and had applied her mouth to the poison many times, I mentioned to the doctor that we had all the conditions present foreshadowing a malignant case; and that, regarding alcohol as a true antidote, I would advise its administration in full doses, the same as when the disease was at its height. Besides the quinine previously prescribed, the patient took a table-spoonful of whiskey every hour with this result: she attended the child's funeral on Tuesday, and in a day or two regained her usual health. In this case, the abortive power of alcohol was fully manifested—a power it rarely fails to assert.

III. THE REPORT OF CASES AND THE CERTIFICATES OF DEATH.

To further substantiate the virtues of alcohol in the treatment of diphtheria, I will appeal to the records of the Health Board of this city. From the figures furnished me by two persons connected with this department, it appears:

In '74, there were reported 1,651 cases of diphtheria; in '75, 2,669 cases; and in '76, 2,329 cases; making in all 6,649.

During the same years, respectively, there were reported 580, 965, and 812 deaths from diphtheria, and 318, 451, and 412 deaths from croup, making the total mortality from diphtheria, 2,357, from croup, 1,181, and from diphtheria and croup, 3,538.

Now, if it be assumed that all the cases reported as diphtheria were genuine, and that the majority of deaths from croup had a diphtheritic origin, as doubtless is true,* then there will be slight grounds for congratulation over the progress made by therapeutics. The mortality is truly appalling. Even were diphtheria and true croup regarded as identical in nature—different names for the same morbid condition—the exhibit would still be far from flattering.

From Jan. 10th, '74, when I lost the young girl whose history is the first presented in this paper, to this date, I have reported 78 cases of diphtheria, and lost one only. This even does not rightfully belong to the list, as the child had been un-

* The above statement is substantiated by the elaborate report of Dr. Pilcher on Croup and Tracheotomy to the Society, April 17th, '77. He shows by the records for the past seven years—'70 to '77 inclusive—that in sixty-two different instances, have two or more fatal cases of croup occurred in the same house, either upon the same day or within a few days of each other; and also, that the deaths reported as from diphtheritic croup were in '74, 71; in '75, 164, and in '76, 128.

der the care of a homœopathic physician for several days. A younger child lay dead in the house when I was called. Besides, the patient refused all food and medicine, and died in thirty-six hours. An older child promptly recovered.

To these 78 cases should be added some eight cases or more, which, from the slight local trouble or other cause, were not reported, but which, from the course of the disease, I am convinced were really diphtheritic. Three of these cases—two of which are related above—from the delay in resorting to brandy and quinine at the outset, required much longer treatment than usual. Thus it appears that, in a period of three and a half years, 85 cases of diphtheria have been treated, successively, without a failure. What is more, not a death appears under the head of croup, or other disease—the sequel of the diphtheritic poison.

The following report was also furnished me as to the number of deaths and their causes for the same period :

Old age, G. B., 81, and E. M. D., 84 ; heart disease, A. G. G., 58, and J. H., 70 ; softening of brain, D. S. G., 76 ; cancer, C. K., 46 ; apoplexy, A. H. C., 47 ; phthisis, J. N., 45, and E. H. P., 59 ; pneumonia, N. L., 61 ; congestion of lungs, L. M., 2 ; jaundice, L. E. B., 64 ; typhoid fever, I. W. E. B., 40 ; cerebro-spinal meningitis, B. K., 45 ; cystitis, E. G., 75 ; Bright's disease, G. P. W., 50 ;

puerperal fever, S. W. T., 33; diphtheria, M. E. M., 7; scarlatina, R. M., 5; chronic eczema, J. S., 3; cholera infantum, H. C., 16 mos., E. DeF., 16 mos., N. L. P., 15 mos., J. J. D., 18 mos., and A. B., 6 mos.; marasmus, A. S. L., 3 mos., and B. W. D., 1 mo.; convulsions, D. W. O., 6 mos., and B. B., 7 mos.; whooping cough, A. A. Q., 4 mos.; dentition, W. D., 12 mos., and D. P., 15 mos.

In this connection, it may be well to examine the claims of tracheotomy as a forlorn hope. The point is, will it increase or lessen the chances of recovery? Dr. Pilcher's tables of operations in this city lead to the conclusion that twenty per cent. has been saved after the failure of medicine. If this be so, then surely no case should be given up until the aid of surgery has been invoked. Such aid having rarely, or never, appeared proper in my practice, I thought the grouping of diphtheria, croup, œdema glottidis, and laryngitis under one head might involve a fallacy. The results of my investigations are presented in the table following:

	Opera- tions.	For Diph- theria.	Recov- ery.	Death.	For Croup.	Recov- ery.	Death.
A., G. H.	2	2	I	I	....	....	....
B., J.....	2	I	....	I	I	I	....
B., I. H..	3	....	....	....	3	....	3
B., E. S..	3	2	....	2	I	....	I
C., G....	5	....	....	....	5	2	3
C., J.....	7	....	....	....	7	....	7
C., A. B..	I	I	....	I	....	....	....
D., D. A.	2	2	....	2	....	....	....
E., G. A..	2	I	....	I	I	....	I
F., M....	2	2	....	2	....	....	....
F., G. R..	II	7	I	6	4	I	3
G., H. J..	I	I	....	I	....	....	....
G., A. G.	I	I	....	I	....	....	....
G., C. H.	3	3	....	3	....	....	....
G., W....	15	10	I	9	5	....	5
H., R....	3	I	....	1	2	....	2
H., J. C..	25	15	....	15	10	2	8
H., N. G.	I	I	....	I	....	....	....
J., C.....	2	I	....	I	I	....	I
J., J. G..	6	....	....	....	6	....	6
K., D. E.	2	2	....	2	....	....	....
K., J.....	12	8	2	6	4	2	2
L., H....	I	I	I	...	....	....	....
M., J. M.	5	3	I	2	2	I	I
O., W. C.	I	....	....	....	I	....	I
P., L. S..	8	6	3	3	2	....	2
P., O. S..	I	....	....	....	I	....	I
R., J. C..	10	6	....	6	4	2	2
R., H. N.	4	3	....	3	I	I	....
R., H....	I	I	....	I	....	....	....
R., F. W.	8	4	I	3	4	I	3
S., W. F..	I	I	....	I	....	....	....
S., S.....	4	I	....	I	3	I	2
S., G. K..	2	2	....	2	....	....	....
S., F. H..	I	....	....	....	I	....	I
W., G....	I	I	....	I	....	....	....
W., W....	I	....	....	....	I	I	....
W., J.....	I	I	....	I	....	....	....
W., W. T.	I	I	I	....	....	....	....
W., J. S..	I	....	....	....	I	....	I
W., R. M.	I	....	....	....	I	....	I
	164	92	12	80	72	15	57

Of these 164 operations, 92 were for diphtheria, of which 12 recovered and 80 died—13 per cent.; 72 were for croup, of which 15 recovered and 57 died—20 per cent. Before the appearance of diphtheria in this city, Dr. John Cochran, a bold and skillful surgeon, had seven operations for croup, all of which died; and, during the same period, seven operations for strangulated hernia, all of which recovered. Dr. I. H. Barber relates a similar experience. Dr. R. Hesse had three fatal cases in succession. Since then he has met with two cases of croup, in which the call to operate was, apparently, imperative. The parents hesitated and begged for time. This was allowed, and small doses of calomel were given. Eventually, when the doctor went prepared to operate, the breathing had become so much easier that he declined to interfere. Both children recovered.

In the years '74, '75, and '76, there were 6,649 cases of diphtheria reported to the Health Department, and, in the same interval, 2,355 certificates were presented—a ratio of mortality greater than one to three. If, as is persistently stated, many physicians report every simple affection of the pharynx, follicular tonsillitis particularly, as diphtheria, how humiliating stands the record! The plague of olden times was not more destructive. No wonder, with an ill-success such as this, the physician, in his extremity, flies to the surgeon for succor. Should this be? Need

medicine be so helpless as to be content with thirteen per cent. of recoveries? I make bold to say that, had these 92 cases been treated early, freely, steadily, and persistently, with alcohol, the majority would have been saved; and that, had this remedy failed, there would have been no chance for tracheotomy.

IV. THE PREVENTIVE MEASURES.

During the prevalence of diphtheria in a family, those exposed directly or indirectly to infection should be protected by having a free circulation of air through the house, and by taking a certain amount of alcohol each day until the patient has recovered. My usual prescription is here given :

℞ Quinoidine.
 Cinchonizæ sulp., āā gr. xii.—xxiv.
 Acid. sulp. aromat. - - 3 ij.
 Sp. frumenti. - - - ℥ viii. M.

S. Fifteen drops to a tablespoonful, four or five times a day, according to the age of the subject.

To all young children and to many adults, I am in the habit of directing brandy or whiskey alone, in the above proportions. For the patient, quinia is substituted for the quinoidine, and the interval between the doses shortened to one or

two hours. Six drachms an hour is the maximum quantity for an adult.

Most cases of diphtheria have, in addition to the common epidemic influence, a direct exciting cause. This will be found, when contagion is excluded, to be poisonous emanations of some kind in the house, or on the premises. The *fons et origo mali* with my patients, I have traced, in most instances, to sewer-gas. To hit upon some plan that would effectually shut out this deadly agent from the dwellings of my patients, I read many scientific articles on the subject, and conversed with many practical plumbers on the methods they adopted; but to no purpose, until it so happened, two years since, that a family of mine, the subjects of ever-recurring sore throats, gastric disorders, diphtheritic attacks, was happily rid of the poison. The plumber carried an iron ventilator, four inches in diameter, from each soil-pipe where it makes the outer bend of the closet-trap to the roof of the house. This ventilator replaced a lead one of small calibre, that had proven itself quite useless. Since this work was done, all forms of filth-disease have disappeared. The smaller pipe only gave egress to the gas under strong pressure; whereas the larger one acted on the principle of a flue, a draught being excited by the warmth of the gas. The larger pipe, also, permits a return-current.

In building a new house, the extension of the

soil-pipe to the roof would serve the purpose fully; only in this case, were there more than one water-closet, it would be necessary to carry a ventilating pipe from the outer bends of the lower traps to a point above the upper trap, and there join it to the common soil-pipe. This is to give air to the traps; for, should a flow of water take place at the top floor, it would, if of sufficient volume to fill the soil-pipe, siphon out all the traps below. In other words, the water, entangling and carrying down bubbles of air as it passes the outer branch of the traps, creates a vacuum and sucks the traps dry. For the same reason, the leaders from the roof are poor ventilators, as every heavy rain will, almost certainly, empty all the traps in the house. When the soil-pipe, furnished with the air-pipes mentioned above, terminates in the kitchen flue, a perfect, or nearly a perfect, immunity from the presence of sewer-gas is attained, however much it may be forced upward by the accumulation of water and filth in the sewers.

When all this has been done, and a fancied safety attained, there may still be, from the lack of proper care—to use no harsher expression—on the part of the plumber, a free ingress of gas into the house, by secret passages more direct than to the roof by the ventilator. The soil-pipe, when of lead, may be fissured or corroded; and, when of iron, loosened or separated at the joints.

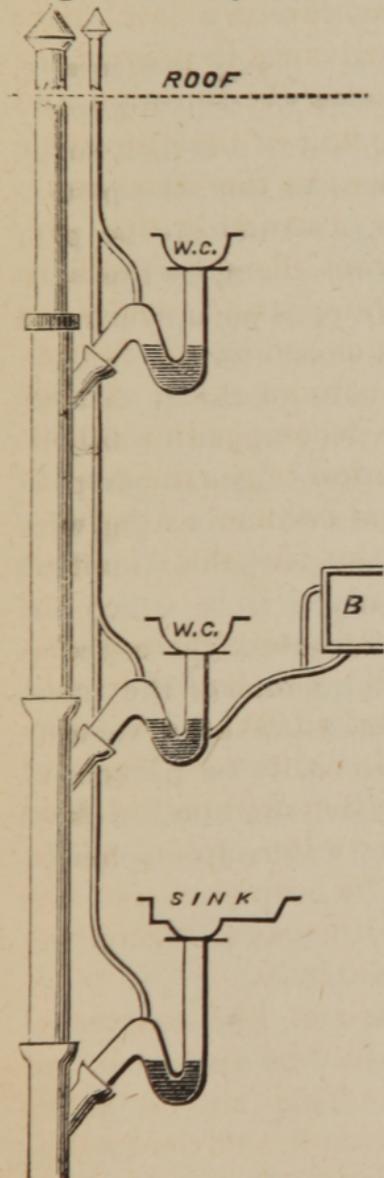
It may make angular turns, run on a level, have a trap, valve, or other contrivance to prevent the gas of the sewer from entering the soil-pipe, and may, by thus checking the flow of the filth to the street, retain it, more or less, on the premises.

Of course, any device or obstruction that prevents a free circulation from the outer wall to the roof, will stop the draught, and render the ventilator useless. A flue closed at the bottom cannot have an ascending column of air. Under such circumstances, as the decomposition of animal matter and the generation of gas are continuous, the pressure will soon become excessive—too great to be resisted by the small body of water in the traps.

A waste-pipe from a basin or sink may discharge into the soil-pipe. The leader from a piazza-roof, or a drain for surface-water, may connect with the sewer. In either case, traps are of little use, as, in the one, they will be siphoned out by the flow from the water-closets above, and, in the other, emptied by evaporation in dry weather; and thus in both, the gas will enter the house, either directly or indirectly.

Therefore, to avoid these and like sources of danger, a lead soil-pipe should be discarded, and one of iron substituted. This should make curved turns, incline at an angle sufficient to ensure the prompt discharge of its contents, have an open channel to the sewer, and be impervious

to gas at its joints.



The traps in the laundry, kitchen, and pantry should, equally with those in the water-closets, have air-pipes connecting with either the main ventilator, or a smaller one that extends to the roof. In other words, all waste-pipes terminating in the soil-pipe must have communication with the air at the outer bend of their traps. The

piazza - leader and the water-drain should discharge into the traps of the kitchen water-closet.

The waste-pipes of the basins should run into the trap of the water-closets; and then, to make the bed-rooms doubly safe, a trap should be placed under each basin, and furnished with an air-pipe, as in other instances. If a room is rarely used, the precau-

tion must be observed, in order to keep the

trap of the basin full, of turning on the water every few days.

The capacity of the sewers being inadequate, and their descent insufficient to secure a ready flow, their contents, during rainy weather, surge to and fro, and by suction, like that of a piston, empty the traps. The same result may be produced during a violent wind-storm, by the sudden rarefaction of the air, causing upward and downward currents in the ventilators.

Against this danger, there is the poor safeguard of letting the water run so as to refill the traps. A better plan is to have a small air-pipe extending to the roof, instead of connecting with the ventilator, as is the practice of the plumbers who loaned me the electrotype from which the cut was taken. By its adoption there seems little doubt that the siphoning out of the traps, or, in other words, the creation of a vacuum in the outer arm of the traps, will be prevented, whether by the flow of water, the suction from the sewer, or the rarefaction of the atmosphere.

CHAPTER III.

OBSERVATIONS MADE DURING THE EPIDEMIC OF
'77 AND '78.

In continuation of my paper on diphtheria, read before the Kings County Medical Society, and presented in the last chapter, I will now bring my report down to the present writing—May 15th, '78. By this addition to the time covered by my cases, it is hoped that the virtues of alcohol as an antidote will be satisfactorily demonstrated to all; even to those, if any such there be, who are as yet not wholly convinced.

Thus far, the epidemic has, in my practice, been more severe the present than the two preceding seasons; in the fact, more especially, that diphtheria and scarlatina have re-asserted their kinship, one either following close upon the heels of the other, or both announcing themselves together. In most cases, the bloodless veins and nerveless muscles, though the membrane fell in a day or two, were very marked. Nevertheless, now as heretofore, the effect of alcohol, whether aided or not by quinine and iron, in restoring the health, was prompt and complete. Save the fatal case, none suffered serious interruption to convalescence, or permanent deterioration of vital energy.

In the interval between February 7th, '77, the

date of the last case in my previous report, and November 23d, '77, the date of my first case in this, I did not meet with a case of diphtheria. Since then I have treated forty cases of diphtheria, of which three were complicated with scarlatina, and perhaps one other that died. If to these be added the eighty-five previously given, thus extending the period of observation to more than four years, the grand result of only one death in one hundred and twenty-five cases is presented—a result so astounding as almost to stagger belief.

Surely the action of alcohol must be direct, positive, specific, when, by its use in a series of epidemics, attended with great fatality under accepted modes of treatment, such unheard-of success is attainable.

TREATMENT ILLUSTRATED BY CASES.

Typical cases treated with whiskey, or with whiskey, quinia, and cinchonia—Diphtheria-poisoning, but no exudation.

J. D. C., aged 3 years and 11 months, was taken with diphtheria the 2d of February, '78. The fever was high, tonsillitis severe, and the exudation extensive, but thin and creamy. The second day the general and local condition was much the same, only the exudation, which had concentered in distinct layers, was separating at several points and hanging in ragged flakes. The third, the fever had abated, the tonsils receded, and the

membrane fallen. The fourth, there was a general coolness of the surface, much greater than normal.

The only treatment enforced was comprised in the administration of two drachms of whiskey every hour and a half, together with varying proportions of quinia and cinchonia. The medicine was given regularly for three days and nights, but, thereafter, irregularly at night. Convalescence progressing, the dose was lessened and the interval lengthened. In ten days, the boy, though still weak, resumed his usual activity.

While he was recovering, his brother, two years younger, came down with the disease, and had similar but more urgent symptoms. As the baby only took a bitter mixture under compulsion, whiskey alone was used—ninety minims every hour and a half for three days. Now, the child, which had previously refused all nourishment, began to take sparingly of milk. The fourth day, the coolness of the surface of the body was more decided than in the first case. In a week, by a reduced dose of the alcohol, convalescence was fully established.

The only remaining child, a boy nearly six years of age, who had been taking whiskey and quinine as a preventive, was attacked just as his brothers were fairly out of the woods. The general symptoms of diphtheria were present; but the local absent, excepting a slight injection of

the pharyngeal capillaries, and a small white point on the posterior palatine arch at the root of the tongue. The breath was very foul, more so than with the others. For fear the membrane would, sooner or later, declare itself, the alcoholic treatment was employed in this, as in the other cases. The fever lasted three days, was attended with excessive weakness, and terminated in a decided lack of animal heat. Thereupon, the system, seemingly freed from a morbid element—doubtless the poison of diphtheria—speedily righted itself.

The mother of these children, *æt.* 35, being attacked, March 9th, '78, with a violent influenza, took two teaspoonfuls of whiskey every two hours the 10th, 11th, and 12th, from an early hour in the morning to a late one in the evening. On the 13th, feeling relieved of the load on the chest and the other symptoms peculiar to the disease, by the secretion of mucus, she discontinued the treatment. On the 14th, she seemed, except a slight huskiness of the voice, restored to her usual health. In the evening, however, she became languid and drowsy, and, in the night, had fever, muscular pains, headache, and tenderness of the throat, internally and externally. On the 15th, the mucous membrane of the fauces presented a bright-red color, and an œdematous, glistening appearance, as though the inflammation was of a grade high enough to cause the

effusion of serum under the epithelium. The tonsils were studded with diphtheritic patches.

One-half ounce of whiskey was given every hour, and a pill, containing one grain each of quinia, cinchonia, and quinoidine, four times a day.

The first six hours the general and local symptoms continued to increase in severity, particularly the neuralgic pains in the head; but soon thereafter to decrease, so much so that in the evening there was less dryness of the skin, less irritation of the throat, and less discomfort generally. Early in the night, the skin was bedewed with a gentle perspiration, and later, the pulse became soft, equable, and regular, and the whole surface of the body decidedly cool to the touch. On the 16th, the œdema had disappeared, and the inflammation receded from the fauces; but the patches on the tonsils were larger and thicker. The symptoms of excitement were now succeeded by those of prostration. This change was still more marked in the evening, when dizziness and faintness were occasioned by sitting up in bed, and still more in the night, when the pulse became indistinct, the impulse of the heart feeble, and its first sound inaudible.

On the 17th, the patches had fallen, and the mucous membrane resumed its natural color, except a deep-red surface—the site of the exudation. The patient has, the past two days, taken

twenty-four ounces of whiskey; and that, too, without experiencing at any time the slightest feeling of stimulation. On the contrary, the effect of the alcohol was, apparently, like that of some powerful vascular and nervous depressant—aconite, or veratrum viride, for example. As the semi-paralytic state of the heart was still pronounced, almost as much as the night previous, the recumbent posture was rigidly maintained. The whiskey was given every hour and a half, and the pills every three hours.

The circulation had gained so much in volume and force on the 18th, that she was allowed to sit up; on the 19th, to go down stairs; and on the 20th, to take a short walk. All this while, except the night of the 20th, the medicine had been given regularly.

Thus it appears, that a grave case of diphtheria, complicated with one of the gravest of complications, is so promptly mastered by alcohol and quinine, that the patient, within the week, takes a short walk, and, thereafter, continuously improves without a drawback.

What short of an antidote would produce such a result?—a result incredible to one who has never been an eye-witness to this mode of treatment.

J. D. C., the boy who had the diphtheria in February, was again taken down the day after his mother. This attack was less severe than the

first, and resulted in a more prompt recovery. There was nothing in his symptoms, or in the treatment, worthy of note.

Nursing mothers with diphtheria.

Mrs. D., nursing a baby three months old, was taken with diphtheria simultaneously with her sister, December 31st, '77. Her daughter, six years of age, had been attacked with the disease a week previous. Her son, ten years of age, followed the mother. He had the general, without the local symptoms, of blood-infection. By the same means—alcohol and quinine—and in the same period, he regained his health. The mother was ordered two teaspoonfuls of whiskey with quinine, and the baby ten drops of whiskey, every hour and a half. The breast-milk became very scanty, and was supplemented by condensed milk with lime-water. At the end of a week, neither mother nor baby required further care.

Mrs. T., nursing a baby six weeks old, was taken with diphtheria, January 2d, '78. She was ordered two teaspoonfuls of whiskey every hour, and the baby six drops of Jamaica rum every two hours. The mother's milk having dried up, it was, after the falling of the membrane, restored by the steady application of the child to the breasts; and yet the child suffered no detriment, save indigestion and colic. On the third day, the mother was attacked with a profuse me-

trorrhagia, which continued thirty-six hours, and then abruptly terminated. In two weeks, without addition to the treatment, every vestige of the disease was obliterated.

Mrs. B., nursing a baby four months old, was taken with diphtheria, February 24th, '78. The mother's milk became very scanty; and yet, as the child refused other nourishment, it had of necessity to suffice. The treatment was the same as in the other two cases. My attendance was for six days only.

Scarlatina—Scarlatina and diphtheria.

C. D., *æt.* 9, was attacked with scarlatina in a severe form, December 5th, '77. On the eruption fully declaring itself, he took continuously the following :

℞ Liq. ammoniæ acetat.
 Sp. frumenti, . . . āā ʒ ij. M.

S. Two teaspoonfuls every hour and a half in water.

The sequels of blood-poisoning did not show themselves.

M. D., *æt.* 12, the sister of the above, was attacked with scarlatina and diphtheria, December 12th, '77. The prostration was extreme, and the pulse uncertain, small, and rapid. The breath had a sickening, disgusting odor, and the face,

hands, and feet a dusky, shrunken look. The tonsils, though engorged and bronzed, offered little impediment to deglutition. The membrane seemed, as soon as formed, to break down into putrescent matter, that loaded the breath and filled the room. The eruption appeared on the chest in raspberry-colored spots, which neither ran together in a general blush, nor invaded the rest of the trunk, or the arms and legs. On the fourth day, the eruption, of a bright, natural hue, appeared on the hands and feet.

The treatment was the same as the brothers'; only the dose was increased to three teaspoonfuls, and repeated every hour. After three days, the acetate of ammonia was replaced by the sulphate of quinine. As the alcohol began to evince its power in about thirty-six hours by a copious secretion of pus, the breath became less fetid, the pulse less shaky, the capillaries less sluggish, and the oppression less profound. Directly, the two poisons were under control, and, being robbed of their venom, offered no further resistance to the vital forces, as they strove to restore harmony in the system and power to each function. In twelve days, convalescence was established.

The baby, *æt.* 12 months, was, whilst the second case was in progress, attacked with scarlatina in the mildest form. The eruption ran over the surface of the body without materially disturb-

ing his wonted activity and playfulness. This result was thought to be due to the preliminary treatment, as the baby had, from the time when the sister came down, taken fifteen drops of whiskey every three hours. On the appearance of the rash, no change was made in the treatment, except the shortening of the interval between the doses to two hours.

A. P. D., *æt.* 40, the father of these children, was attacked with scarlatina and diphtheria New Year's eve. His condition resembled his daughter's very closely in most particulars, only the signs of blood-poisoning were more pronounced. The eruption had the same character, and followed the same course. The pulse was irregular and intermittent, and the surface dusky and shrunken. Restlessness, jactitation, and insomnia persisted for forty-eight hours, when they were overcome. The throat was somewhat swollen internally, and indurated externally. On one tonsil there was a diphtheritic patch that was shed and renewed for two weeks. There was left an excavation that was filled up by granulation.

Mr. D. took a tablespoonful of whiskey every hour, combined at first with the acetate of ammonia, but subsequently with the sulphate of quinine.

The father and the two children were fed almost exclusively on lime-water and milk, until

their convalescence was far advanced. To this, lemons and oranges were the chief exceptions. As a result of this diet, the digestion was easy and natural, the urine clear and abundant, and the recovery prompt and complete.

Diphtheria—Diphtheria and scarlatina.

L. B. and E. J. B., aged respectively 9 and 3½ years, had an attack of diphtheria the first week in December, '77, and made a rapid recovery.

January 24th, '78, I was again called to see L. B., who had then been ill for six days. From the dullness of the mind, the sluggishness of the circulation, the induration of the glands, the blueness of the fauces, and the putrescence of the breath, it seemed as though the delay had been so long as to give the alcohol but little chance to exercise its antidotal power. Nevertheless, in five days, three drachms of whiskey every hour, together with eight grains of quinine daily, removed the torpor, energized the heart, softened the induration, lessened the fetor, and detached the membrane. When, in a few days, convalescence was fairly inaugurated, the heart's action became so feeble as to necessitate a strict enforcement of the horizontal posture. To the alcohol and quinine in less frequent doses, the muriated tincture of iron was now added. His usual health was not fully regained before the completion of the sixth week.

January 27th and 28th, E. B., *æt.* 13; A. M. B., *æt.* 16; Lillian B., *æt.* 7; and E. J. B., *æt.* 3½, came down with the disease. They presented the same symptoms of putridity and malignancy as the brother, and Lillian had, in addition, scarlatina. Under the treatment above detailed, they all speedily recovered, except the youngest, that died on the eighth day. Whether or not scarlatina contributed to this event could not be accurately determined, as an efflorescence that appeared on the chest the first day soon vanished. That there was neglect the first two nights is certain, as the attendant thought it better to let the child sleep than to disturb her with medicine. The result was, whatever the cause, the death of the patient that seemed at first the least ill of the five attacked.

The true diphtheritic membrane.

W. A. B., *æt.* 29, had fever, sore throat, and general *malaise* the 10th of February, '78, particularly during the night. The next morning when I saw him, each tonsil was covered with the wet-chamois-leather exudation. Otherwise, the fauces were not involved. I prescribed a tablespoonful of whiskey every hour and a half, and nine grains of quinine a day. The second morning, the febrile excitement had subsided, and portions of the membrane fallen. The third, the tonsils presented a red, jagged surface, free from membrane. The pulse was slow and measured, and the skin

as cool as though it had just been bathed with an evaporating lotion. The fourth, he came down stairs; the fifth, he walked out; the sixth, he gave up his medicine, went to his business, and returned to his evening amusements, contrary to advice. For this rashness he had, the first of March, an attack of acute rheumatism, which soon yielded to free doses of salicin.

Typo-malarial diphtheria.

F. W., *æt.* 6, was taken, the night of March 17th, '78, with a croupy cough and febrile symptoms. In the morning, when I was called, the fever was high, the fauces inflamed, and the tonsils dotted over with diphtheritic points—the mouths of the follicles. The second morning, these points had coalesced into a thick, continuous, leathery membrane. She took two drachms of whiskey every hour the first day, and three the three following days—making in all one quart by the graduated glass. The fifth, sixth, and seventh days, the interval between the doses was increased to an hour and a half, and at night more time was allowed for sleep. The reason for the change was the lowering of the pulse, the calling for food, and the falling of the membrane, excepting that filling the follicles. The evening of the seventh day, the surface of the body was cool. During these three days, she took nineteen ounces of whiskey.

On the eighth day, convalescence seemed to be established. On the ninth, there was no membrane; but a diffused redness, and a return of the croupy cough. The tongue, which had been much coated, became dry and crusted. The secretion of bile was partially suppressed, and the desire for food lost. On the tenth day, the whiskey was decreased to one and a half drachms every two hours, and the quinine changed for ammonia. On the fourteenth day, a free secretion had restored the voice and resolved the croupy cough; but three small patches had appeared on the tonsils, a slight epistaxis and hæmoptysis had occurred several times, and the exudation had showed itself in the vulva. It being thought that the ammonia had, by rendering the blood alkaline, counteracted the effect of the antidote, and thus caused the unfavorable symptoms, the whiskey and quinine mixture was resumed (ʒ ij every two hours), and the muriated tincture of iron was given in eight-drop doses three times a day. In from forty-eight to seventy-two hours the patches fell, the mucous inflammation disappeared, the hæmorrhage ceased, the tongue cleaned, and the strength returned. On the twentieth day, there being no further call for my visits, they were discontinued. The girl's health has since been fully regained.

Five physicians of this city, whilst attending malignant cases of diphtheria, have contracted the disease. Of these, two were treated by accepted modes, and died, and three by the alcoholic, and recovered.

Dr. Geo. G. Hopkins, of this city, performed tracheotomy on a child *in extremis* from diphtheritic croup the past Winter, and was in constant attendance to the time of its death—ten days thereafter. The same night, he discovered a membranous patch on each of his tonsils. Immediately, he began the use of brandy in full doses—two tablespoonfuls every hour. This large quantity, repeated on time, caused no stimulation until the end of three days. As the modern tablespoon holds six drachms, more or less, he must have taken in seventy-two hours about three quarts of brandy—and that, too, without experiencing the slightest excitement. On the fourth day, he reduced the amount of brandy and commenced the use of quinine. The only other remedy was the chlorate of potash as a gargle.

On the second day, the membrane was loosened, and, on the third, detached. Experiencing no secondary disorder except weakness, he very imprudently resumed his business, including night-calls, in a week's time. The cost of this imprudence was confinement in the house for several weeks with acute rheumatism, to which he is subject.

I present the cases of Drs. Catlin and Watt in their own words :

BROOKLYN, Feb. 26th, 1878.

Dear Doctor :

I send you briefly my personal experience with the grim disease diphtheria; and I do so with more than ordinary satisfaction, because I feel that the treatment used in my case proves the truth of all you have said so many times at our Society in regard to the beneficial results of saturating the system with alcohol.

I was called, December 6th, '77, to assist in the opération of tracheotomy for a case of diphtheria where the membrane had invaded the larynx and trachea, and was subsequently detailed, as one of several physicians, to watch the case. Two days after first exposure, the disease declared itself in my own system, and announced itself by a prostration so absolute that only those who have made personal acquaintance with this modern plague can comprehend it. Within six hours after the membrane first appeared on the tonsils, my strength was so entirely gone as to leave me almost absolutely helpless. Under the guidance of my faithful friends, Drs. Hallett and Campbell, the whiskey and quinine treatment was pushed, and from the first dose of the stimulant I was conscious of benefit. The membrane began to disappear in thirty-six hours; but the

convalescence was slow, and the constitutional depression continued for over a month after the attack.

It may be said truly that the local manifestations were slight; but the prostration came so suddenly, was so absolute, and continued so long, that the presence of some virulent blood-poison was apparent. The alcohol was exhibited every hour at first, in tablespoonful doses, but was only felt in a general warming sensation through the system without any exhilaration until the third day, when, for this reason, it was given in diminished doses. From the first, I was conscious that it not only held the disease in check, but gave me the power so much needed to fight it successfully; and now I am more earnest than ever in urging the same course upon my patients, while I feel personally under a debt of gratitude to you for the constant, persistent, and emphatic way in which you have called our attention for the last few years to this way of using alcohol in this most treacherous and alarming disease.

The stimulating plan of treatment has long been followed by all of us; but we, as a profession, owe you a lasting debt for insisting upon *early alcoholic saturation* of the system as the true way to exhibit the stimulant, if we would gain its antidotal effect and throttle the disease early in its history.

Yours, sincerely,

A. W. CATLIN.

OFFICE OF JAMES WATT, M.D., }
276 CARROLL ST., Brooklyn, April 23, '78. }

E. N. Chapman, M.D. :

DEAR SIR—During a period of twelve years, I have constantly kept in view, in the treatment of diphtheria, the laws laid down in the article published by you during the year 1863. I have good reasons for believing that many of my cases of diphtheria were cut short, and the severity of the attack lessened, by the use of alcoholic stimulants. I find that it reduces the pulse, lowers the temperature, induces sleep, and stimulates the sympathetic nerves. I believe that it has, in several instances under my observation, prevented cardiac paralysis. I have been surprised at the quantity which the patient, at any given age, may use during the attack. So far as my experience goes, I have frequently given half an ounce every hour to a child of from five to eight years, without any of its toxical effects being exhibited.

During the year 1876, I suffered with a severe attack of diphtheritic poison, from the constant attendance upon a family of five persons who were affected with the disease. I was taken with severe rigors, muscular pains, headache, and sore throat. The only kind of liquor I had at home was Jamaica rum, of which I took about two ounces every three hours, with ten grains of quinine every six hours. In less than twenty-four hours I was free from pain, had no exudation on

my throat, and was able to attend to my office duties in two or three days.

While I am willing to give all due credit to the alcohol taken, I must confess that quinine must, and always will, play an important part in the treatment of this disease; but I am satisfied that any one who will give the alcoholic treatment a fair trial in cases of diphtheria will never have cause to regret it.

Yours, truly,

JAMES WATT.

That alcohol has a specific power over the poison of diphtheria—the same as over the poison of the rattlesnake—is to my mind more fully demonstrated (if this were necessary) by every fresh case coming under observation. The freer the dose, and the earlier the treatment, the more prompt the effect, and the more complete the cure. Thus, blood-changes are anticipated, and the fell destroyer is met face to face as he breaks his way into the citadel of life. The quantity of alcohol given should be regulated by the volume of the circulation and the malignancy of the disease, and not by rules applicable to ordinary cases. An excess would be safer than a deficiency, as the one would do no harm, and the other might fall short of the full specific effect. Dr. Hopkins wisely administered to himself two tablespoonfuls of brandy every hour, seeing that

for ten days his blood had been continuously taking in the poison. The fear of stimulation is not to be entertained, whatever the complications present that, under ordinary conditions, forbid the use of alcohol, as it will now, as in simple diphtheria, be the most powerful antiphlogistic to reduce the pulse, lower the temperature, and subdue the inflammation.

In further proof of this direct and positive action of alcohol, I find by trial that its immediate presence in the blood is needed to neutralize the poison, and attain full specific effects—that, taken some days before or after the infection of the blood, it is of little efficacy. Hence, a person exposed to contagion ought, on the second or third day, to begin the prophylactic treatment, and, thereafter, to continue it a week or more.

What establishes the alcohol on a still broader, firmer foundation is the fact, that, having been tried the past six months by many physicians of this city, it has yielded results emphatically confirmatory of mine. Several have not lost a case; and all, though now and then unfortunate, have met with a success to them unknown before. As far as my inquiries have extended, I am warranted in the statement, that, with those using the alcoholic treatment, pure and simple, the ratio of recoveries has reached 95 *per centum*. This good report passing from mouth to mouth has raised alcohol into high favor—so high that it is now

considered by many here, whatever else they may think proper to unite with it, the remedy *par excellence*. This change of practice is beginning to tell on the statistics of the disease, as appears by comparing the cases and deaths of the last six months with those of corresponding months of preceding years.

CASES OF AND DEATHS FROM DIPHTHERIA.

	1875.		1876.				
	Nov.	Dec.:	Jan.	Feb.	Mar.	Apr.	
Cases, .	348	353	345	305	271	214	= 1838
Deaths, .	98	106	90	112	89	84	= 579

Less than one death in three, or 31.5 to 100.

	1876.		1877.				
	Nov.	Dec.:	Jan.	Feb.	Mar.	Apr.	
Cases, .	173	229	208	181	210	229	= 1230
Deaths, ,	61	71	77	57	94	68	= 428

More than one death in three, or 34.79 to 100.

	1877.		1878.				
	Nov.	Dec.:	Jan.	Feb.	Mar.	Apr.	
Cases, .	242	252	242	173	180	135	= 1224
Deaths, .	72	50	56	32	43	37	= 290

Less than one death in four, or 23.69 to 100.

The figures above presented show that there has been a remarkable improvement in the ratio

of recoveries the past six months, especially when it is considered that, of the great bulk of those practising medicine in this city, but few comparatively have employed the alcoholic treatment. This one fact, at least, ought to arrest attention. In the last epidemic, there were in the months named 1230 cases of, and 428 deaths from, diphtheria; and, in the present epidemic, 1224 cases and 290 deaths—the saving of 138 lives. Surely, the hope is not premature that the dawn of a better day is at hand—one in which this great scourge of the young in very many parts of this country shall be met fearlessly, and conquered promptly.

THE SPHERE OF ALCOHOL.

Alcohol is adapted to a much wider range of application than is thought advisable, or safe even, by the majority of the profession. In the earlier years of my practice, in accordance with the doctrines I had been taught, I never resorted to stimulation, however moderate, when there was the slightest arterial excitement, without much hesitancy and many misgivings. Safety lay, according to the general opinion, in the direction of reducing measures as long as the fever and inflammation persisted. These being subdued, it was deemed imperative to feel the way cautiously, lest the heart might be excited and the disease renewed. Hence, a resort to

stimulants might be too soon, but rarely too late.

As, however, many cases of ship-fever fell to my lot, I soon found that the more I disregarded the skin and pulse, and gave support to the struggling vital forces by such mild means as wine and broth, the better fared my patients. At length, as I ventured to give small doses of brandy early, the improvement was still more prompt. Consequently, when, by my ill-success in diphtheria, I had come to the conclusion that it, equally with typhus and typhoid fevers, was a blood-disease, I was not wholly unprepared to adopt a supporting, stimulating treatment. I soon found, as my cases multiplied, that the earlier the use and the freer the dose of alcohol, the milder the disease and the quicker the recovery. The fever subsided, the inflammation receded, the membrane fell, and convalescence began, as though some magic influence had blighted the germs of disease. Here, certainly, was not the effect of a stimulant, but of an antidote.

At first, when diphtheria appeared in company with scarlatina, croup, pneumonia, or other disease that forbade, according to the views I then held, the use of stimulants, I was in great perplexity, inasmuch as what was indicated in one was contraïndicated in the other. It seemed as though, by the intervention of a purely inflammatory disease, I was debarred the use of my remedy. Proceeding with much caution, I discov-

ered, by tentative trials, that the accessory disorder, however high the fever and rapid the pulse, yielded to the alcoholic treatment *pari passu* with the primary, but went from bad to worse, whatever else was done, when the alcohol was insufficient to neutralize the diphtheritic poison. Hence, I was ultimately led to disregard all complications, and push my remedy in heroic doses, so as to destroy as quickly as possible this poison which imparts its quality to every morbid process arising in its course.

In the same way, I became satisfied, when hæmorrhage from mucous cavities, congestion of the kidneys, feebleness of the heart's action, loss of muscular power, or other condition—the sequel of diphtheria—showed itself, that the antidotal treatment was still the main reliance.

Thus, eventually, experience fully convinced me that the alcohol was not only the remedy for the diphtheria-poison, but also for its effects. These are, almost always, varied expressions of functional torpor of the sympathetic system—the one common pathological state, I am thoroughly convinced, of every disorder attendant upon, or following after diphtheria. At the outset, there is a semi-paralysis of the vaso-motor nerves of the fauces, resulting in engorgement (not inflammation), the transudation of the *liquor sanguinis*, and the formation of the membrane. A like condition of the vaso-motor nerves, distributed to

the mucous tissue, induces hæmorrhage, to the lungs pneumonia, to the kidneys albuminuria, to the heart and voluntary muscles paralysis. Hence, with the blood freighted with a poison which acts on the nerves of organic life with such deadly energy that the various functions—the sum of which is vitality itself—are either suddenly suppressed, or continuously obstructed, what can the physician accomplish unless he first remove the cause? This done, the effects are under command.

I conclude, therefore, that alcohol in large doses is, at an early stage, both an antidote and an antiphlogistic; but that alcohol in small doses is, at a later stage, together with quinine, a stimulant and tonic to the sympathetic nerves, by and through which the circulation of the blood and the nutrition of the tissues are accomplished.

In scarlatina, rubeola, influenza, sewer-gas-poisoning, and most low types of fever, there is a like contaminated state of the blood, and a like impression upon the sympathetic nerves. At least, alcohol is more efficient than any other article in modifying these diseases, and aiding nature in its recuperative efforts. In fact, most inflammatory diseases, even though sporadic, originate from morbid materials in the blood—the effete matters generated in the system—and not from external causes. These retrograde

products depress the sympathetic nerves, and weaken the animal functions. In practice, I find that, speedily after the violence of the disease at the onset has spent itself, the alcohol and quinine are far superior to all other articles of the *Materia Medica*.

The stimulation of the sympathetic nerves is markedly efficacious in most chronic diseases in which the restoration to health is dependent mainly on a more active interstitial nutrition. This is evinced in bronchitis by the secretion of mucus, in pneumonia by the resolution of the hepitization, in tuberculosis by the limitation of the deposit, in scrofula by the reduction of the glands, and in suppuration by diminution of the discharge. The same remark is applicable in most disorders that depress the nervous energy, and impair functional activity.

In stomach and bowel affections, alcohol sustains its reputation by the improvement in the digestive processes; in debility, by the return of muscular power; and in anæmia, by the deeper color of the blood. In a word, when the organism has for a time been thrown into disorder, and obstructed in its movements, the stimulation of the motor force that keeps each and every part in operation is of the first moment. The reduction of this force robs nature of the power of resistance: the increase of it sustains her in the contest, and not infrequently renders victory possible.

If alcohol act as an antidote in diphtheria and its congeners, it will be of the first importance, in order to secure definite results, to employ fermented liquors of the standard proof. It would be better, should there be a doubt of their quality and strength, to use alcohol alone, the effect of which can be definitely estimated and exactly regulated. This course might, perhaps, be advisable under all circumstances, inasmuch as the remedy would then be placed among drugs, and the scruples of many persons be relieved. At least, the change would not imperil the welfare of the patient. The following formula, which I have used, answers every purpose :

℞ Quiniæ sulp.
 Cinchonix sulp., āā gr. viii-xvi.
 Acid. sulp. aromat., ʒjss.
 Fr. cinchonæ comp., ʒ iv.
 Sp. rectificati, ʒ ivss.
 Aq. fontanæ, ʒ iij. M.

For an adult, from four to six drachms is the proper dose, which in severe cases is to be repeated every hour.

DIETARY OF LIME-WATER AND MILK.

There is a point in the treatment of diphtheria, only casually alluded to heretofore, that demands close attention when the disease persists, complications arise, or sequelæ follow. This point—the

diet—may at first be a matter of little concern ; and yet, in a day or two, one of the highest moment, inasmuch as the repair and waste of the system are dependent, almost wholly, on the vitality of the blood and the tonicity of the nerves. Nutrition, secretion, and excretion failing, medicine loses its efficacy and meets with no response.

As the diet enjoined has, in my later cases, consisted chiefly, if not exclusively, of lime-water and milk, it seems incumbent upon me, in order to render the details of treatment complete, to explain the action of lime on milk, and give the reasons why the product, thus formed, is claimed to be superior to any other article of food.

The importance of diet, either in health or disease, can scarcely be overestimated. In the sick-room, the use of broths, extracts of beef, tea and toast, and the many farinaceous preparations that, until the last four or five years, held undisputed sway, has now given place, more or less, to that composed largely or wholly of milk. This change was mainly due to the fact, that milk contains all the elements of nutrition in the exact proportions needed by the several tissues of the body ; but other articles, separate principles only—the proteinaceous, the amylaceous, the oleaginous, the saline, etc.—that might or might not be so adjusted as to supply the demands of nature. A deficiency, or a disproportion, in

the animal, vegetable, and mineral constituents of one's food seriously impairs digestion, impoverishes the blood, and perverts assimilation—matters of no light import, when the welfare of the patient depends upon the integrity of the nutritive functions.

To plain milk, which is gradually supplanting everything else in the dietary of infants, and even those of riper years, there exists the serious objection that it is, from the large, solid curds formed in the stomach by the action of the gastric juice, quite indigestible—a condition of things the same as when pieces of meat are swallowed entire. As these masses of curd are to be liquefied from circumference to centre by a slow, laborious process of disintegration, such a diet can but be more faulty than the old, with all its shortcomings. In health, it oppresses the stomach, excites dyspeptic symptoms, and occasions, oftentimes, a smart febrile attack. How, then, can its steady and exclusive use, if thus prejudicial to the well, be salutary to the sick, whose gastro-intestinal secretions are disturbed and vital forces depressed? For one, I am fully convinced that plain cow's milk is unfit to be the main article of diet in any case, whether that of children or adults, and especially when the character of the solvents of the food is much impaired by disease.

To remedy these objections to plain milk, the

addition of an alkali has been advised, particularly in the case of infants. Lime, potassa, soda, or ammonia is selected indifferently, as the action of each is thought to be the same—the removal of acidity, and the promotion of digestion. Now, an ounce and a half of lime-water, containing less than a grain of the alkali, will, when added to a glass of milk, obviate its bad qualities, and render it the most friendly substance that can be given, even to those who never drink it plain without a sense of uneasiness and weight at the epigastrium, and that, too, though employed as the sole diet in typhoid cases.

Will potassa, soda, or ammonia, in grain doses, produce the like effect?

Having, the last five years, fed babies to the completion of the first dentition on lime-water and milk, the earlier months exclusively, and the later with the addition of farinaceous preparations only, I have attained certain striking results—results to which, hitherto, I had been a stranger. It is surprising how vigorous is the digestion, how compact the frame, how hard the flesh, how clear the skin, how bright the face, and how rich the blood; and, besides, how rare are common ailments, and how prompt the re-action against grave diseases. In physique, they are not unlike the uncared-for little brats one may see—dirty, ragged, unkempt, playing by the roadside in remote country-places, where modern progress has

not stamped the life-blood out of the coming generation.

Will potassa, soda, or ammonia, given one, two, or three years uninterruptedly, be thus conducive to health?

Lime develops remarkable nutritive qualities in milk by virtue, not of its alkalinity, but of an undetermined chemical property, which has the singular effect to render the milk acceptable to the stomach, easy of digestion, and ready for assimilation. Thus the phosphate of lime, the prime factor in tissue changes, is, in the ratio of 2.31 to 1,000 parts of milk, presented to the blood and distributed to the growing cells. That cow's milk has highly nutritive properties is demonstrated practically, on a large scale, by the rapid growth of calves the first few weeks after birth. Here the milk and the stomach are exactly adapted; not by art, but by nature, the one to the other.

Lime has a peculiar action on oil and on milk, as is shown by very simple experiments. An ounce of lime-water, representing six-tenths of a grain of lime, and an ounce of olive, or linseed oil, when shaken together, become a thick, honey-like mass that does not change by keeping; but an equivalent proportion of the other alkalies dissolved in water and mixed with the oil, form a thin, yellowish fluid that soon separates into its original constituents. In the first ex-

periment, there is formed a permanent emulsion ; but, in the second, a temporary admixtne only. There is, as I claim, a like re-action between the lime and the oil-globules of the milk, that intensifies the emulsion already existing, and renders the normal, but weak bond of union, closer and more intimate.

Four grains of pepsin will precipitate the casein of an ounce of plain milk almost immediately ; but, if lime-water be first added, not for three or four hours. The first experiment yields dense, adherent masses ; but the second, fleecy, broken curds, that are so soft and fine as on agitation to blend again with the whey, and restore the original white, opaque color. The emulsion formed by the re-action between the cream and lime is neither disturbed by citric, or hydrochloric acid, nor is a black precipitate thrown down by calomel.

My inference, therefore, from observation and experiment, is that milk, by the addition of lime, is enabled to resist the prompt action of the gastric juice ; that the precipitate formed eventually is fine and flocculent, and, consequently, is easily digested ; that all the constituents of the milk, properly elaborated, are presented to the lacteals for absorption ; that the blood receives each element of nutrition in the proportion required for perfect assimilation ; that the hydrochloric acid of the gastric juice—an agent in the solution of

protein-compounds second to pepsin alone—does not affect the emulsion ; that the casein is beyond the reach of the vegetable acids ; that the affinity of calomel and other chemicals for lime is less than that of cream, whereby the special effect of medicine is not impaired ; and, finally, that lime in the proportion of a grain or less to eight ounces of milk renders it a perfect food—one answering all the demands of the digestive organs, and all the requirements of the nutritive functions.

Not only does milk represent all other foods, but certain medicines as well—cod-liver oil, the phosphates, the salts of iron, the vegetable acids, etc., etc.—which are in common use by physicians to remedy the defects of an ordinary diet. Here is a natural product, within the reach of all, which offers the oil, the phosphorus, the lime, the iron, and every other principle necessary to normal nutrition, in a state of chemical combination far better adapted to the wants of the system than in the rude substitutes of the *Materia Medica*.

At an early period of infancy, condensed milk is preferable to plain, inasmuch as the more intimate union of its constituents by heat aids the lime in preserving the division of the casein. So, also, at a later age, and even at any period of life, there may be the same reasons to influence the choice, when the gastro-intestinal secretions are excessive and very acid.

As, however, its mawkish taste when diluted with water forbids its general direction to those old enough to insist on their likes and dislikes, it is desirable to have a preparation of similar qualities. Such a one can be readily improvised by first making a gruel of farina or ground barley with water, and then adding five or six parts of milk a few minutes before the skillet is removed from the fire. This gruel should, from the labor thrown on a weak stomach by starchy compounds, be very thin—only just enough in substance to form a thickened mixture with the milk.

In preparing the baby food, take of condensed milk two, of warm water twenty-four, and of lime-water four teaspoonfuls. To this, add half of a teaspoonful of powdered sugar—about twenty-five grains—and of salt, a pinch—about two grains. If the infant be more than a year old, the water may be diminished to twenty teaspoonfuls. By the same scale of dilution, plain milk, when of good quality, should be reduced by one or two parts of water, according to the age of the child, and then the other ingredients added, as in the first instance. The ratio of lime-water to cow's milk is, for ordinary use, as one to seven, or two tablespoonfuls to a tumbler of milk, and three to a goblet. This proportion of lime-water, however, may be increased with advantage by a quarter or third part, whenever the

gastric secretions are much in excess. As, at the outset of any serious illness, the digestion is in abeyance and the assimilation at a stand-still, it is often advisable to give the milk scalded in a gruel of farina or barley. In a day or two, however, the lime-water and milk—diluted or not, as the case may be—will constitute the most acceptable and nutritious diet, even when continued for weeks together. For an adult, three pints of milk in the twenty-four hours, given in larger or smaller quantities at a time, are sufficient to sustain the system, and afford all the nourishment attainable by other kinds of food.

ORIGIN OF THE ANTIDOTAL TREATMENT.

If alcohol be, as has been abundantly shown in the preceding pages, a true antidote to the diphtheria-poison, it will be not inexpedient, at the close of this work, to give the facts upon which my claims to the discovery are based. I lost a little girl five and a half years old—the victim of diphtheria—December 23d, '60. The treatment was conducted on the plan then in vogue. My first trial of alcohol in full doses and at the inception of diphtheria, as detailed in the *Boston Journal*, February 3d, '63, is here given:

“ A few days after the death of this girl, I was called to see another about the same age, who

was scrofulous, fleshy, a hearty eater, and delicate from confinement within doors. The child had great irritability, a high fever, a hot, dry skin, and a rapid, full pulse. Great difficulty was experienced in swallowing, from the inflamed and swollen tonsils, on one of which a membranous patch was seen. A teaspoonful of brandy and a quarter of a grain of quinine were directed to be given every hour, and the nitrate of silver was applied every morning. This treatment was continued uninterruptedly for four days; when, on the disappearance of the membrane, the quinine and caustic were omitted, and the brandy given singly. This was to prevent a relapse, in which it was successful, and to correct the altered state of the blood. On the morning of the second day of the disease, the fever was lessened, the skin disposed to perspiration, and the swallowing easier; though the membrane had extended, and the tonsils were darker colored, and bled when roughly touched.

“On the third day, there was a great improvement in the symptoms—diminished vascular excitement, the membrane stationary, and looking thicker, more raised, and of a yellowish color.

“On the fifth day, the engorgement of the tonsils had subsided, and the membrane had disappeared.”

As early as the Spring of '61, the action of alcohol in diphtheria was explained to the stu-

dents in the Long Island College Hospital, and its marked efficacy illustrated by cases. The following case is an example :

“ During the session of '61, a little girl, 11 years of age, presented herself at the College Clinique, brought there by her mother. Four weeks previous, she had had the diphtheria—simultaneously with three other children in the same house. All, except this one, died ; and she escaped as by a miracle. The mother stated that at first her throat was in a frightful condition, that there was bleeding from the nose, and that, in two weeks, these symptoms abated, when her weakness was very great, and she was both blind and deaf. After a time, the power of the arms was lost, when sight and hearing began to return. In a few days more, the legs began to be affected, at which period she was presented to my notice. The power in all of her extremities was nearly equal, though very imperfect and uncertain ; hearing and sight apparently good ; the countenance stupid and idiotic ; and great dullness of the mind, which seemed to partake of the general lethargy. This case was treated with brandy and good food. In a few days, there was a general improvement in all of the upper portions of the body ; but walking was much more difficult, and well-nigh impossible. The child, from this time, was not brought back for twelve

days: the mother, who came to renew the prescription, stated as a reason, that, from the loss of power in her legs, it was impracticable, although there was now less weakness in the arms, and her intelligence was improving. After her return, it was nearly three weeks before she regained the perfect use of her lower limbs. Eventually, however, she was completely restored in every respect, both in mind and body; as, several months subsequently, I had the opportunity of observing. The manner of this creeping paralysis was not a little remarkable; and, still more, the torpor of the brain, which resulted, for the time being, in an abolition of two of the special senses, and probably, though the stupidity of the girl was too great to determine this point, of the others also."

During the above college term, I had a severe case in private practice. The resort to alcohol was not as prompt as is now my custom. It will be observed, however, that the dose of brandy used is the same as that employed in my later cases:

"Master C., aged 6 years, scrofulous, small in stature, and of defective vital power, was attacked with the most intense congestion and inflammation of the tonsils, and had a bounding, rapid pulse of 120 pulsations per minute, and a high fever. On the second day, the symptoms

were aggravated; especially the condition of the throat, which was now hard and swollen in the parotid region. The mucous follicles of the tonsils were distended with a white matter, giving them the appearance they present in follicular inflammation; which disease it was supposed to be, and treated accordingly with diaphoretics, etc. On the third morning, these white points had united, covering the tonsils uniformly. The entire fauces were more inflamed, had a darker hue, and were disposed to bleed on examination. There had been nose-bleed the previous night. The fever was high, the restlessness and irritability very great, and the pulse 150 per minute.

“The boy was now put upon brandy and quinine: the former, at first, in teaspoonful doses every second hour, then every hour, but eventually every half hour; the latter, in quantities of six grains in the twenty-four hours the first three days, when, on the supervention of *tinnitus aurium*, the dose was lessened. A portion of quinine was given for five days; but, after this period, only stimulants and nourishment. At the outset, beef-tea was ordered; but, from the difficulty of swallowing, little was taken during the height of the disease. The parents were enjoined to be particular in administering the amount of stimulant directed, whatever else might be neglected. During a part of the treatment, the patient took a weak solution of chlor-

ate of potash; given more for the purpose of bathing the throat as it was swallowed, than from any reliance on its systemic effects.

“The second day after commencing the use of brandy and quinine, there was the following condition: the fauces uniformly covered with membrane, the fever and heat of skin gone, the surface bathed with perspiration, and the pulse equally rapid as at first.

“On the third day, there was a profuse perspiration, an oozing of blood from the tonsils, epistaxis, and greater evidences of prostration, as shown by restlessness and jactitation. Though the quantity of brandy now given was large, the effects of a stimulant were not observable.

“On the fourth day, the membrane was detached at several points, was raised, thicker, yellowish, and appeared as though it would soon fall off. The inflammation had subsided so much that the act of swallowing was more easily effected; yet the pulse was still soft and rapid, the weakness extreme, and the sweating profuse and exhaustive.

“From this date, the improvement was rapid—the membrane hanging in shreds, and finally dropping off, and the engorgement of the throat subsiding, so that the parts resumed their natural appearance.

“On the ninth day, the membrane disappeared, and did not subsequently return. On account of

the debility of the patient, the brandy was continued for some time after my attendance ceased. Under its use, the child recovered from the debility so characteristic of this disease, and regained his wonted health."

To show my treatment still further at that early day, I will add one more case :

"Mr. B., Fulton avenue, 35 years of age, a baker by trade, working in a close, under-ground room, of a pale look, emaciated appearance, and of a weak, delicate constitution, was taken with a sore throat, November 1st, '62, and had fever, thirst, and inflamed tonsils—in other words, was seemingly attacked with tonsillitis. On the second day, the mucous cryptæ were filled with a white secretion, giving the parts the appearance of follicular inflammation. On the third day, many of these white spots had coalesced ; and the uvula, becoming inflamed, had a small patch of exudation on its surface. There had been epistaxis during the night ; and the tonsils, disposed to bleed, were now covered with drops of blood, which exuded on forcibly depressing the tongue. The patient experienced an aggravation of symptoms from a gargle of the sulphate of zinc which he had been using. Both this and a diaphoretic mixture were discontinued, and brandy and quinine substituted. He took continuously half an ounce of brandy and half a grain of

quinine every second hour, until there was ringing in his ears, when the latter was omitted, and the stimulant alone administered. The brandy was continued in a gradually diminished dose, until convalescence was established, and then iron was given to improve the quality of his blood.

“ Directly after commencing this course of medication, the disposition to spontaneous hæmorrhage was overcome, the congestion of the fauces abated, and the membrane, becoming thick and yellow, fell off, and was not renewed. At this time the uvula, being implicated, turned of a black color at its extremity, and sloughed off. Counting from the first appearance of the membrane, it was ten days before the fauces were free of it; and the patient, though using such bracing and sustaining remedies, was daily getting weaker and more debilitated. Now he was scarcely able to maintain the erect posture, his legs giving way from under him; and he sweat profusely, drenching the clothes whenever he slept; yet, in two weeks more, his usual health was regained.”

In the transaction of the Medical Society of the County of Kings,* I am thus reported :

“ Dr. Chapman made some remarks respecting diphtheria. He thinks it a blood disease, the

*April, '61, vol. 1, p. 199.

poison of which may be eliminated in health—the throat trouble being but a symptom of general constitutional disturbance.

“He commenced the treatment of the disease [on its appearance in '58] with mercurials, and, locally, with caustic; but his experience had convinced him that these remedies are injurious, and he now relied entirely upon brandy and quinine, and upon simple gargles.

“Brandy, he thinks, acts not only to strengthen the system, so that the poison may be eliminated; but the alcohol increases the plasticity of the blood, while the tendency of the disease is to disorganize the blood, and allow the albumen to form the membrane.

“Dr. Chapman thinks the condition of the throat is not that of inflammation, but is merely congestion—a stasis in the capillaries.”

The above extracts fix the date of the first use of alcohol by me in free doses at the inception of an attack of diphtheria. If it so be that any one followed this treatment at an earlier day, it will be just and proper in him to present documentary proof of the fact, and take possession of his rights. In concluding this little work—which will, doubtless, be assailed by reasoning *a priori*, by arguments *ad captandum vulgus*, by the keen, incisive sarcasm of that host of critics whose bounden duty seems to be to protect inviolate

the domain of rational medicine, so-called—I ask one favor, and one only: that the statements herein made shall be tested empirically, by the actual treatment of a series of cases under the conditions laid down, before judgment is passed, and the court adjourned. In other words, that the defendant shall have a fair trial before he is condemned. With this preliminary to criticism—a formality rarely observed—I am certain that the critics will become advocates, even enthusiastic advocates, of the new doctrine—the ANTAGONISM OF ALCOHOL AND DIPH-
THERIA.

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