Notes, Sanitary and Otherwise.

The work entrusted to local boards of health is of great importance. It relates not only to life and health, but may have much to do with the financial condition of towns. When promptly done and well done it may save a town many hundreds of dollars. This thought should have a place in the minds of municipal officers this spring, and as level-headed and efficient men as are obtainable should be appointed as members of local boards of health.

Each board should have its one or two medical members if practicable, but the having of a physician as the executive officer is not essential. Some of the most efficient local public health work done in this State has been done by non-medical men. If a really good man for this place is found, he should be kept as long as possible.

The following incident has a bearing upon the financial aspect of the work of local boards of health: The municipal officers of a town failed to appoint a local board of health in 1897. Diphtheria appeared, some deaths occurred, and a wide spread epidemic appeared imminent. Urgent requests from the State Board of Health were unheeded, until the ultimatum of immediate prosecution was sent. Then after an unnecessary prevalence of the disease a board was established, and the disease was stopped.

The appalling disaster which overtook the battle ship which bore the name of our own State is deeply felt, far more for the loss of life than for anything else. Meanwhile we cannot refrain
from thoughts of the comparative indifference of the general public to the fact that, instead of hundreds, thousands of persons in this country are dying from causes that are largely preventable and that should be prevented.

In the State of Maine alone, more than one thousand persons die every year from pulmonary tuberculosis, after a lingering illness, the prolonged solicitude and grief of relatives, and the contraction of bills which often nearly or completely pauperize the family. The carrying out of a few well-defined precautionary measures would save many of these lives.

That which is of prime importance is the disinfection of the sputum of consumptives and rooms and things that have been infected with it, because it is known that infection with the bacillus of tuberculosis is the one great cause of consumption. It is, therefore, a deplorable fact that communities can look on with equanimity while consumptives are slowly dying, meanwhile infecting their surroundings, while, in many cases, no rescuing hand gives explicit directions for the saving of the other members of the family against the danger of infection.

Again it is deplorable that infected houses ("phthisis nests," as they have been called) should remain undisinfected, not only during the illness, but after the deaths of tuberculous patients; and that even such houses are vacated, and are re-tenanted by other families all unconscious of their danger. A strong public sentiment should prevent such useless sacrifices.

Another phase of this question is that not only is infection largely preventable, but after infection, during the incipency of the disease, the chances for the cure of the patient are good, provided he can have a fair show in the struggle for life. This means that he must temporarily live an outdoor life under constant medical supervision, and this means sanitarium treatment.

The results of the treatment of consumptive patients in sanitariums have been so favorable abroad, even where the climatic
conditions are less favorable than in Maine, and again in Northern New York and other places in this country, that we shall, undoubtedly, sometime deem it a humane and a paying policy to save some part of this annual waste of from $1,000,000 to $5,000,000 involved in 1,000 deaths from consumption, when, as has been conclusively shown, a large part of this might be saved by a few months’ sanitarium treatment.

In this direction there is abundant opportunity for persons of ample means to found an institution in this State that would benefit, inexpressibly, the poor, and moderately well-to-do. It would be a philanthropy of the highest type.

It is said that the Department of Agriculture has discovered that many creameries are using an emulsion of cottonseed oil, which, added to the cream, increases the butter product per gallon of milk, with small chance of detection and a large increase of profit.

The congressional bill for the prevention of the adulteration of foods, drugs, and condiments, while not just what public health officers might prefer, should be opposed by those only who see increased profits to themselves by fraudulent additions to our food supplies. National legislation in this direction has long been needed, for the saving of our health, our pockets, and our foreign markets. It is the most economical, and the only effectual way of dealing with this evil.

Professor Sedgwick of Boston in his rules for obtaining clean and healthful milk, tells milkmen: “Above all, the hands of the milker should be carefully washed just before he begins to milk, his own personal cleanliness being even more important than that of the cow.”

In the revised circular of this Board on typhoid fever, it is taught that, “the disease is sometimes widely spread by milkmen whose milking is done by persons whose fingers are infectious, or whose milk supply is kept too near the sick-room or the privy vault, or whose milk cans are washed with infected water.”
Another source of typhoid infection, too little borne in mind, is the fingers of the nurse or mother who attends to the wants of the sick, and then turns to the preparation of food for the family. An ordinary washing of the hands does not suffice to ensure against the transmission of the germs.

In the sick-room there is just one source of infection. Typhoid fever is sometimes spread by means of infectious dust which comes from the personal clothing or the bed clothing that has been soiled with the discharges from the patient and afterwards dried. See the circular for precautionary rules.

George Rafter, C. E., of Rochester, N. Y., referring to the desirability of the sand filtration of water supplies, as is the practice in European cities, says: “The root of the whole matter will be found chiefly in improved methods of administration in the American municipalities. It may be set down as self-evident that a politically governed city will be far behind in all the arts which go to make life really safe as well as enjoyable.”

So far as the process of self-purification of rivers goes, two principal influences are operative,—the destructive influence of sunlight upon disease germs and their sedimentation. In the winter when our rivers are covered with ice and snow, the germicide action of sunlight is inoperative, hence we have one explanation why winter outbreaks of typhoid fever occur quite frequently among the users of some waters which are taken from rivers. Another reason is that the volume of water flowing in our streams is sometimes very low in the winter. But the primary cause is always a sewage pollution and consequently the infection of the water.

The secretary of one local board, after speaking of the excellent results following the use of diphtheria antitoxin in his city says that the board has purchased a supply of antitoxin and an antitoxin syringe which are kept on hand for the benefit of poor people. Such a policy is both humane and economical.
It is economical because, used early, antitoxin will save almost every case and lives have a money value. Again, though antitoxin does not diminish the infectiousness of cases of diphtheria while they last, it shortens the period of illness very much and therefore abbreviates the period of infectiousness. The antitoxic serum can, also, be used in small immunizing doses for the protection of the well members of the family in houses in which trustworthy isolation is not practicable.

At school no two children should be allowed to drink from the same cup. Each child should have his own small drinking cup, then the chances for the transmission of the germs of diphtheria, tuberculosis, and some other dangerous communicable diseases would be smaller, and the schools would lose something of their reputation as a place for the propagation of infectious diseases.

A little while ago we read that small-pox then prevailed in thirty counties in Georgia. This is one of the few states in which no state board of health exists, and in which there is no central co-ordinating authority to advise and aid in stamping out infectious diseases.

A jury in Wisconsin recently returned a verdict of $5,000 damages against the Ashland Water Company. The cause of accident was the alleged negligence of the water company in furnishing impure and unwholesome water, containing typhoid germs, to the plaintiff's husband, thereby causing his death.


Dr. Sanarelli, under date of November 27, wrote to Surgeon-General Wyman: "At the present time I cannot offer my serum as a sovereign remedy for yellow fever. It would be veritable presumption to claim to cure yellow fever when it has already reached its most advanced stages. I believe my serum to be efficacious when administered at the beginning of the disease."

In Glasgow the owner of a fish shop was fined three guineas, with the alternative of thirty days in prison, for having putrid
fish on sale. In Smithfield, a fine of £20 was imposed upon a meat-man for keeping unsound mutton, and another man was fined £3 and costs for sending unsound meat to the same shop. In another place a man was fined £10 for selling bad meat, and in another £40 for doing the same thing. That is the way they do it in Great Britain, as reported in a single issue of one of their weekly journals. How do we do it here?

A family of children at Westchester, Pa., was infected with diphtheria by chewing gum which had been chewed by a child while suffering from the first symptoms of the disease.—Med. News.

The general adulterations of bread are limited to a little alum, a little too much salt, and more potatoes than are needed for the leaven. Of these adulterations alum is the worst; it enables an inferior flour to be made up so as to look as white as a better flour; it also enables the flour to take up more water. Alum makes bread less digestible. This is a great reason why it should not be used, especially as food for young people. Some bakers will tell you they cannot make bread without alum; that is not true. Persons who make their own bread at home do not use alum.—Sanitary Record.

Now for a ready means of detecting alum. Cut a small square out of the crumb of a loaf, put it in a plate, pour on it a mixture of a tincture of logwood and carbonate of ammonia solution—the mixture to consist of equal quantities of each. If no alum is present in the bread the pink color will remain, but the presence of alum turns it blue. This test has never been known to fail.—Ib.

The secretary of the local board of health of one of our Maine villages writes that, "the high and grammar school-rooms in the village are too bad in point of ventilation for the pupils or the teachers to do their work. I think the condition is detrimental to both. I have protested against the present management, but as yet no improvement." It may be added that there
is much time and much school money wasted in our public schools, when pupils and teachers are breathing polluted air. They cannot be at their best as regards physical health, and their mental work is not of the best.

Havana and Yellow Fever.

Surgeon-General Wyman, of the Marine Hospital Service, refers as follows to the unsanitary condition of Havana:

"The harbor of Havana is a cesspool, which for years has received the drainage of the city; besides, it is a veritable cul-de-sac, which cannot be scoured by the tides or by fresh-water streams. The wharves on the Havana side of the harbor are notorious as sources of infection. An examination of the records of the quarantine stations on the South Atlantic and Gulf coasts for 1894, shows eleven cases of yellow fever, all having been taken from vessels arriving at the Dry Tortugas station from the wharves in Havana. Two of these wharves, the Tallapiedra and the San Jose, are especially dangerous. Under the Tallapiedra, empties the sewer from the military hospital, where the yellow fever patients from the army are treated. It has been said that no vessel with a non-immune crew on board has ever been tied to this wharf without yellow fever appearing among them. So well known is it as a danger-point that sailors call it "Dead Man's Hole," and so great is the danger of tying up to it, that captains of American vessels have been known to pay for the privilege of discharging cargoes on lighters in the open bay, the payment being made by deduction from freight charges, amounting frequently to $200 or $300. American captains have frequently asserted that the United States Government should not allow vessels to go to this wharf."

Sanitary engineers have repeatedly shown that these conditions are wholly unnecessary. That a reform of this kind is practicable seems to have been demonstrated in the experience of Vera Cruz, whose harbor was formerly almost as great a menace to the United States as Havana. With the great engineering changes at Vera Cruz, brought about under the leadership of President Diaz, the disease has been practically wiped out in that city.—Forum.
A Suggestion.

The following is taken from a paper which Professor S. H. Woodbridge, of Boston, was called to read before the Convention of the Woman's Health Protective Associations of the United States, held in Philadelphia last May:

"Your most effective educational work, will, therefore, be found to lie in pressing upon popular thought the value of health; the seriousness of menacing dangers which lurk in vitiated surroundings; the supreme value of money as realized only when made contributory to life and health.

"Of these lessons, the last is likely to be found the most difficult to teach, for the love of money is a tenacious root of evil, even in the vital matters of private and public health. To this important and most practical side of our great question, you will find it necessary to devote your sturdiest arguments and your most tactful skill. Men are so generally living on the low level of the purse pocket, that often, only upon that plane can they be found to listen to and to weigh appeals. But even here the effective weapons for honorable encounter are ranged on the side of the champion of life and health.

"He takes up even the murderous threat of the highwayman's challenge, 'Your money or your life!' and sends it back a declaration of fundamental truth, and a message of philanthropic appeal—'Money is for life; devote it liberally to life if you would live largely and strongly; spend your money on life, or else lose out of life that which is infinitely more to it than money!—Your money or your life!'

"With such a declaration of principles, the battler for human life may enter even the monetary arena for conflict with low-minded sordidness, well-armed with lance and sword-like facts with which he may strike telling blows right and left to the complete discomfiture and annihilation of his close-fisted antagonist.

"It is true that even free air cannot be poured into our buildings without some pouring of money out of our purses. But what is money for but to be effectively poured out? The sleeping dollars of hoarded earnings are as useless as is the still water of a stagnant pond. Effective energy is found only in motion, in the current of the water; in the currency of the dollar. And effectiveness is always to be measured by vital rather than by material results."
The Dietetic Uses of Olive Oil.

Olive oil is now used in many ways at one time never thought of. Besides being largely used medicinally, it enters into various processes of cooking much more extensively than it did. It is well known that good eggs fried in olive oil are much better flavored than when other kind of fat has been used. In massage, bathing, and for numerous other purposes, the use of this most natural valuable food is greatly extending. The value of good olive oil is beginning to be more generally recognized throughout the world than it formerly was. Eminent authorities have experimented with it, and found it a potent agent for many defects of the excretory ducts, especially the skin. Eczema has rapidly disappeared upon a discontinuance of starch foods and a substitution of a diet of fresh and dried fruits, milk, egg, and olive oil. Its beneficial effects when taken in conjunction with a fruit diet have frequently been marked upon the hair, nails, and scalp, and supplying to the sebaceous glands the only substance which they secrete when in a healthy condition, and the absence of which is the cause of debility of the hair, frequently ending in baldness. It has long been observed that those who live upon olive oil as a common article of food, and take it as such are generally healthier and in better condition than those who do not. Its therapeutic and prophylactic properties are now well known to medical men. Oil is destructive to certain forms of micro-organic life, and it is reasonable to suppose that they can best be eradicated from the system by its internal use. The use of oil not only does this, but it restores to the worn out or diseased tissue just those elements of repair that its reconstruction demands.—San. Record.

Sanitation Primarily Selfishness.

Sanitation is primarily the outcome of selfishness, a simple effort on the part of the community or the thinking, governing part of it at self-protection. Ultimately it becomes altruistic, or at any rate when the plagues are gone it has passed into a habit, although still cholera is more effectual as a stimulant to the soporose than a discourse on altruism, or even Christianity. Hence it is that sanitary administration, like an infant Hercules,
struggles in its cradle with the serpent brood of infectious diseases, and their destruction is naturally the first evidence of its prowess. But this instinctive effort intelligently directed leads to precisely the same works and executive procedures as the most abstract study of the scientific principles of public health undertaken by the most altruistic of philanthropists would reason out. Exactly the same physical conditions which nourish and sustain epidemics promote chronic ill-health. If we could find a community with a permanently high death-rate and no epidemics, we should find uncleanness of air, water, soil, if not co-existent, at any rate in various combinations, expressing themselves in the detail of slums, want of drainage, want of conveniences, impure or imperfectly distributed water, overcrowding, personal and household dirt, etc., etc.—*Dr. J. B. Russell, Glasgow.*

Against Tuberculosis.

The measures recommended by the Vienna Medical Board to the Magistrate for the reduction of the prevalence of tuberculosis are

"1. *Proper collection of sputa.*—In all public places, of whatever kind, spittoons kept wet or containing water must be provided; materials used in the construction of the interior of public vehicles must be such as to permit of frequent wet cleaning; and such cleaning should be enforced after every journey.

2. *Isolation of tuberculous patients.*—Both in hospital and in private practice. For this purpose the erection of suitable sanitaria, both for invalid and convalescent cases, is specially demanded.

3. *Compulsory disinfection after every fatal case.*—Optional disinfection to be encouraged in all cases, particularly on removal."—*Jr. of State Medicine.*

Answers to Correspondents.

*To Librarian.*—For the disinfection of school books or library books have a tin box made 15 inches long, 11 inches wide, and 8½ inches deep. Have a perforated false bottom or rack to support the books half an inch above the bottom of the box. Have a tightly fitting cover. To disinfect books, pour an ounce of a 40% solution of formaldehyde (sometimes called formalin) into the bottom of the box, put in the rack and upon it the books resting upon their front edges, having the leaves as loosely open as possible. Put the cover on and let the books remain exposed to the formaldehyde over night. This will do for the disinfection of a few books at a time. If school
books have actually been used by persons sick with diphtheria or scarlet fever, the safest way would be to burn the few books thus surely infected, although the experiments of Professor Robinson show that books may be disinfected with formaldehyde. Some other experimenters have corroborated his observations, and some have not succeeded so well.

To a Health Officer.—The disinfecting lamps in which formaldehyde in its solid, or polymerized form, is used, are undoubtedly good things when small quantities of formaldehyde gas are wanted in the sick-room for its continuous antiseptic action, but for the efficient and economical disinfection of rooms, forms of apparatus must be used which are capable of evolving, in a short time, a large quantity of formaldehyde gas from wood alcohol, or from the solution of formaldehyde (formalin.)

To Secretary of Local Board.—It is just as much the duty of the attending physician to report cases of typhoid to you as it is to report cases of diphtheria or small-pox.

To M. D.—The examination of samples of water, bacteriologically or otherwise, for the purpose of determining whether the bacillus of typhoid fever is, or is not present is now-a-days recognized by good authorities to be a fruitless search.

The Fruits of Bacteriological Work.

The following are extracts from a lecture by Dr. Jacobi at the dedication of the Bender Hygienic Laboratory, Albany, N. Y.

"When cholera again appeared, in 1890, Haaffkine of Russia, working in Pasteur's laboratory, found that cholera bacilli, when cultured, lose part of their activity. Imbued as he was with Pasteur's principles, the light flashed upon him. The lowered activity of the cultured bacilli could be expected to be utilized as the healing agent after having been tried on somebody. But animals are immune, so he made himself the object of experiment, and he did not die. Within two years afterwards, in the East Indies, he made 70,000 injections on 42,179 human beings in 98 different localities. No accident marred his operations, though pain followed each of them for four or five days. In order to control his experiments he always vaccinated a part of the population only. What were the results of his laborious and self-sacrificing labors? In Calcutta the morbidity of those vaccinated fell to 1-19 or 1-24 compared with former experience; the mortality fell to 1-17 or 1-24. If in the near future—in Berlin they are experimenting at this moment on the action of dead cultures which appear to immunize—the methods will be improved, and the East Indian and Arabian pilgrims be vaccinated before they start for Mecca, 'Death, where is thy sting? Grave, where is thy victory?'"
"The success accomplished thus far speaks well for the future. It does not require an unbounded enthusiasm to believe that the results will be still more favorable in this dread disease, which destroys the infants and children in every country by the ten thousands, and to trust that further study and experimental labors may find similar methods for the subjugation of other contagious and infectious diseases. The question of rabbit, sheep, or horse rights ought not to be raised. We kill them and eat them to keep alive. In the laboratory we utilize them for the purpose of finding means to keep alive our people, young and old, while but few if any, are destroyed in the process. The problem will be to decide whether the future is to belong to the rabbit and sheep or to mankind.

"All those results could not have been attained without experimentation on animals. The saving of animal and of human lives accomplished by its teaching is simply immense. Let us consider.

"The investigation of the action of remedies cannot be complete without it. Anthrax has lost its terrors amongst the French peasantry since Pasteur discovered how to reduce the mortality of their sheep. One of the most fearful calamities of former times, the terror of every woman who is to become a mother—childbed fever—has been reduced to the very lowest figure wherever the teaching of animal experimentation has been heeded. Hydrophobia, fatal in every case, is now accessible to successful treatment. Myxoedema, an incurable disease a few years ago, has become curable in almost all instances, even cretinism in many. Tuberculosis may be, and is in part, confined within certain limits. The prevention of cholera is no longer a dream. The mortality of diphtheria has been reduced to one-half of what it was. The success of surgical operations under the influence of Listerism is simply marvellous; antisepsis and asepsis have been evolved out of the laborious studies of medical experts.

"It is to me a constant source of painful surprise to find men and women ever ready to attribute bad, selfish and cruel motives to others. Do they think the great experimenters had an easy life? If there is an occupation that strains every physical, moral and intellectual power, it is that of the close student of nature. Nor is the study of nature unattended with danger. When a soldier dies in the very moment that he is bent upon inflicting death upon his adversary, he may be rewarded with admiring songs and a lasting monument. Every physician, every scientist is constantly on his field of battle, and he may die on it. Obermeier was not the only one who, when studying the spirillum of relapsing fever by night and day, sacrificed his life. For him there is no visible monument. Only a few months ago the magazines reported the death of a young experimenter who was killed by his object of study."
Although the general policy in the management of the Sanitary Inspector is the exclusion of long papers, the practical importance of the subject is thought to justify the devotion of this whole issue to disinfectants, and their application in practical disinfection, including the text of the new circular which the Board is just issuing.

Some years ago, the secretary began to make as full collections as possible of papers giving the results of experimental work done for the purpose of determining the value of various agents as disinfectants, and of papers relating to practical disinfection. The amount of experimental work done since Koch's report in 1881, and the report of the American Public Health Association in 1885, is truly enormous. For two years available time has been spent in taking notes from these papers, and in making abstracts of them. The final putting together of this material for the purpose of presenting an intelligible view of what has been determined for each disinfecting agent, has been the laborious work of months. This fuller presentation of the subject of disinfection will appear soon in the Tenth Report of the Board, and has been used as a basis for the new circular No. 68 herewith published.

It will be noticed that sulphur fumigation finds no place among the approved processes. Its omission is in accordance with the resolutions of the State Board made some time ago, but full official adoption of the gaseous substitute for it was delayed until the extended work of Prof. Robinson for the State Board had fully confirmed the favorable conclusions of previous workers regarding the value of formaldehyde, and it has been delayed, in fact, until his results have been many times recon-
firmed, and this agent has been widely adopted as a disinfecting agent by health officials, municipal, state, and national.

But even now while recognizing the well established fact that formaldehyde acts far more efficiently as a germicide than the fumes of sulphur, the committee on disinfection recommends it as nothing more than a very useful auxiliary. The only fear is of inadequate methods of using formaldehyde and that local boards may try to make it do everything.

One member of the committee expressed the opinion with reference to gaseous disinfection that "for general use it ought always to be supplemented by vigorous cleansing of floors and other surfaces with a disinfecting solution. The idea is too prevalent that complete safety is guaranteed by the liberation of formaldehyde gas, and that this is the idea of most local boards of health and physicians there is no doubt. The greater part of this work is utterly unreliable because the gas generator, and not the brains of the people who do the disinfecting, is expected to take full charge of the work."

Among the seven disinfecting solutions, the solution of carbolic acid and that of chloride of lime are the only ones which remain unchanged. A 1:1000 solution of corrosive sublimate is retained, and milk of lime, for some time recommended through the Sanitary Inspector and otherwise, is prescribed for certain purposes. The three new solutions are those of lysol, solutol, and formaldehyde.

Lysol deserves to come into more general use for many purposes. It should be purchased so that solutions will cost less than carbolic acid. It has the combined properties of cresol in a soluble form and of an alkali, though Fränkel, Behring, and Hammer are at variance as to whether it contains free alkali.

Solutol is a somewhat newer preparation. It has received quite a wide European recognition as a cheap and efficient disinfectant for many purposes, particularly for the treatment of infectious discharges, sputum, stalls infected with tuberculosis, etc.

The dilute formaldehyde solution may probably be used for a greater number of purposes than is stated in Circular No. 68,
but the safely conservative course is to adopt only what has been proved to be efficient for a given purpose.

**Disinfection of Books.**

Processes which may be trusted to disinfect books with certainty without injuring them are few: there is apparently but one such process. Formaldehyde gas is entirely harmless to paper, print, and bindings, and when the books are placed in a gas-tight casket or box with the leaves separated as much as possible and a comparatively large quantity of the gas is used, the experiments of Prof. Robinson, Dr. Horton, and others have shown that books may be disinfected. For each cubic foot of space in the enclosed box, one ounce of formalin may be poured upon a rag at the side of the books or upon a tray, or into the bottom of the box itself if it is tight and the books are slightly raised upon a false bottom. The box should then be closed twenty-four hours.

**Disinfection of Sputum.**

It is a serious wrong to allow the sputum of any consumptive patient to go undisinfected or undestroyed. Destruction by fire should be the rule so far as practicable. Comparatively few chemical disinfectants can be trusted to destroy the bacillus of tuberculosis in fresh sputum. An abundance of experimental work has established this fact. Solutions of corrosive sublimate are wholly unsuitable. Milk of lime, a valuable disinfectant for some purposes, is too slow and uncertain for the disinfection of tuberculous sputum. Chloride of lime is too irritating to be kept in the vicinity of the patient. Ascoli states that solutions of formaldehyde are efficient disinfectants for fresh tuberculous sputum, but its action, somewhat like that of corrosive sublimate in coagulating albuminous matter, dictates the advisability of awaiting a wider research in this direction.

Among the agents which may be trusted in this particular line of disinfection, the experiments of Schill and Fischer, Jaeger, and others show that the phenol preparations, carbolic acid, lysol, and solutol, have a special activity when applied to the destruction of the tubercle bacillus. Of these, the work of Buttersack for the Imperial Board of Health of Germany, indicates that lysol is distinctly superior to carbolic acid in the disinfection of tuberculous sputum, and the statement of the
same investigator is supported by that of most of those who have tested it that solutol is a still more active disinfectant than lysol.

For the disinfection of tuberculous sputum in spittoons, a 5 per cent. solution of carbolic acid, or a 4 or 5 per cent. solution of lysol or solutol may be used. The disinfecting solutions should act 24 hours before the sputum is thrown out. When no other disinfectant is available, hot lye, made from wood ashes, may be used, or a tablespoonful or so of washing soda may be thrown in, and the vessel may then be filled with boiling water, covered, and set aside to cool.

The same rules should be applied to the disinfection of sputum in pneumonia, influenza; and their application in chronic bronchitis is also desirable, for the reason that a tubercular cause remains long unrecognized in some of these cases.

**Disinfection of Floors.**

As the work of disinfecting rooms is largely the destruction of infectious dust, the floors as the most extended surfaces for the reception of dust, should receive especial attention. The need of this is shown by various trustworthy reports of the epidemic prevalence of tuberculosis, pneumonia, or typhoid fever in the military barracks, dwelling-houses, or offices, in which a thorough disinfection of the floors and the dust and dirt in their cracks appear to be the reason for the prompt cessation of the epidemic prevalence. Even in typhoid fever, a disease which is generally thought not to infect rooms, we may easily conceive that in some cases where the patient’s clothing or bedding, or even rugs or carpets have been soiled with the infectious discharges, prudence demands a thorough disinfection of the floors with a disinfecting solution.

If formaldehyde is not used, the floors, after all infectious diseases, should be washed thoroughly with a solution of corrosive sublimate, formaldehyde (Solution 7), or carbolic acid. If the floors have probably been soiled with diphtheritic or tuberculous sputum, they should without exception be treated with one of the disinfecting solutions. The same advice should apply to walls or any other surfaces that may have been directly infected with sputum.
Circular No. 68.

STATE BOARD OF HEALTH OF MAINE.

Disinfectants and Disinfection.

Any circular on disinfection should necessarily be considered as only provisional. Modern scientific methods are constantly adding to our accumulation of those facts which help us to destroy disease germs with greater certainty. Our knowledge of the relative activities of the various disinfecting agents and of their applicability to special purposes has in recent years been so widely extended that there has been a great gain in the certainty of results in disinfecting work,—at least so far as the recent additions to our exact knowledge of disinfecting agents are put to practical use.

One great obstacle to improvement in methods is the influence of old traditions. Many agents formerly in repute are now known to have but little value as real disinfectants. (See "Disinfectants, Real and False."")

A disinfectant is an agent which may be used for the destruction of disease germs. A disinfectant is then a germicide. A deodorant is something capable of removing disagreeable smells. Some deodorants are also trustworthy disinfectants, and some are not; while, on the other hand, some disinfectants are very efficient deodorants, and others have less value in this direction.

In disinfecting work, therefore, the distinction between disinfection and deodorization should be kept strictly in view, and agents and processes should be employed which, by the more exact methods of modern times, have been proved to be efficient destroyers of infection.

The observance of this reasonable rule will exclude the use of some "time honored" disinfectants and many patent, or proprietary preparations. As regards the latter generally, they may
well be replaced by solutions which may be prepared under the
direction of any druggist, physician, or experienced health
officer, and which are more economical and of known efficiency.
The sale of some of the old nostrums is still bolstered up by
testimonials or favorable words uttered before exact methods of
testing them were known.

**DISINFECTANTS, REAL AND FALSE.**

*Carbolic Acid.*—Although not one of the most rapidly acting
disinfectants, this has been one of the most useful. Some other
agents are preferable when the time for disinfection is neces-
sarily brief. When it can have ample time to act, its action, as
well as that of the cresol preparations, is continuous; for, in
exerting its disinfectant power, it is not itself decomposed by
organic matter, as is the case with the oxidizing agents,—
chloride of lime, permanganate of potassium, etc. Its action
is unimpaired by the presence of acids, alkalies, salts, or albu-
minous material. The activity of its solutions is increased by
the addition of common salt. Solutions are also more effective
when warm or hot. Dissolved in alcohol, oil, or glycerine,
carbolic acid loses nearly all its disinfectant qualities. The
dangerously poisonous nature of carbolic acid indicates the
necessity of precaution against accidents by swallowing, or by
too extensive applications to the human body.

*Crude Carbolic Acid.*—Crude carbolic acid is only slightly
soluble in water, but a 3 per cent. solution of soap in hot water
dissolves up to 5 per cent. of carbolic acid and forms an effec-
tive disinfecting solution for many purposes. The disinfectant
properties of crude carbolic acid are due principally to the pres-
ence of cresol.

*Cresols.*—These are derived from crude carbolic acid by dis-
tillation. They are somewhat more efficient than pure carbolic
acid. The cresols are but sparingly soluble in water. Various
expedients have been resorted to for increasing their solubility,
some of which are indicated in the following paragraphs.

*Lysol.*—This preparation contains about 50 per cent. of cresol
rendered soluble with neutral potash soap. It forms clear solu-
tions with water in any proportion, and thus has an advantage
over carbolic acid for some purposes. Comparing lysol other-
wise with carbolic acid, it is found that its solutions are some-
what cheaper than those of pure carbolic acid, that they are
somewhat more efficient, that they are more likely to injure the
colors of fabrics, and they are a little less poisonous than solu-
tions of carbolic acid. Lysol is superior to carbolic acid for
the disinfection of excreta, and in work of this kind it is a good
deoctorant. In the disinfection of tuberculous sputum it is
more efficient than carbolic acid as it dissolves and penetrates
albuminous masses more rapidly. Its solutions may be used
for washing floors, woodwork, etc., and for the disinfection of linen and cotton clothing by soaking in the solutions.

**Tricresol.**—Is a mixture of the three cresols,—o-m- and p-cresol. It is soluble in water to about 2½ per cent. only, is more efficient than carbolic acid, and is somewhat less toxic.

**Solutol.**—It contains 60 per cent. of cresol rendered soluble with cresol-alkali. It is intended for gross disinfection. The results obtained by most of the investigators indicate that it is very efficient, considerably more so than carbolic acid or lysol. It penetrates organic matter and is well adapted for gross disinfection, particularly crude solutol which is cheap and effective. For general use half a pint of the solution may be mixed with two or three gallons of water.

**Creolin.**—Its active constituents are the cresols emulsified in a solution of hard soap. The English creolin (Pearson's) contains about 10 per cent. of the cresols. With water a dirty white mixture results. It is a good deodorant and a fairly good disinfectant for fecal matter. The usual strength of its solutions is from 2 to 5 per cent. Little's Soluble Phenyle is probably about the same thing.

**Corrosive Sublimate.**—Under favorable conditions a rapidly acting disinfectant; but it coagulates albuminous matter and is decomposed by hydrogen sulphide and various other materials. It is, therefore, unsuitable for the disinfection of tuberculous or other sputa, or of excreta. Other disadvantages are that its solutions must be prepared and kept in glass or earthenware, that they will destroy metallic waste-pipes, and that they are very poisonous if swallowed.

The rational use of solutions of corrosive sublimate as a disinfectant is, therefore, restricted to the disinfection of walls, floors, the wood finish of furniture, upholstered furniture, clothing which must be treated with disinfecting solutions, and the personal disinfection of hands, hair, beard, and face. The colors of most fabrics are unaffected by them.

**Lime.**—In the form of lime-wash or “milk of lime” is a good disinfectant for excreta, but it should be used in large quantity and must have ample time to act. Lime may also be used for the destruction of other offensive organic matter, and the disinfection of walls and other surfaces that will admit of such treatment.

**Chloride of Lime.**—Is one of the best of disinfectants and may be used for the same purposes as lime. The quantity of its solution used must be in excess of that of the material to be disinfected. Chloride of lime should come from a trustworthy source, should be preserved in hermetically sealed packets, and its solutions should be freshly prepared.

**Soap—Potash and Soda.**—Soap and water may be used not only for cleansing, but when as hot as can be borne by the hand
or hotter, soap and water or solutions of washing soda have considerable disinfecting power. The discharges from the bowels, or tuberculous sputum may be disinfected with hot lye, 1 part of hard-wood ashes to 2 of water.

*Permanganate of Potassium.*—This cannot be classed with the disinfecting agents which act with the greatest rapidity and certainty. In general disinfection it has no place, but it is used for some special purposes.

**Sulphate of Copper.** (*Blue Vitriol*).—This is a good disinfectant, but the range of its applicability is limited. It may be used for the disinfection of excreta,—1 or 2 per cent. solutions, —but other trustworthy disinfectants are cheaper.

**Sulphate of Iron.** (*Copperas*).—This was formerly in use, but it is now known to be worthless as a disinfectant. As a deodorant it is also inferior to some other agents.

**Sulphate of Zinc.**—This has been shown to have no practical value as a disinfectant.

**Chloride of Zinc.**—Has some power in restraining the growth of bacteria, but as a real disinfectant it is practically without value.

**Gaseous Disinfection.**—The idea that the whole work of disinfecting rooms and their contents may be done by the liberation of some disinfecting gas or fumes is a visionary one. It should satisfy only where the work is entirely perfunctory. But gaseous disinfection, particularly the use of formaldehyde, may be regarded as a valuable auxiliary.

**Sulphur Fumigation.**—It has been shown again and again that, by means of sulphur fumigation, the destruction of disease germs is uncertain or impossible under the conditions in actual practice. When the material to be disinfected is damp and is enclosed in gas-tight rooms, the gas has some disinfecting action; but ordinary rooms cannot be made gas-tight, and sulphur fumes seriously injure many articles when they are damp. The gas is dangerously poisonous when much of its is inhaled. It escapes from rooms readily and a little in adjoining rooms renders them uninhabitable.

For these various reasons the State Board of Health omits sulphur fumigation from the list of disinfecting processes which are recommended.

**Chlorine Gas.**—Chlorine gas is a more efficient disinfectant than the fumes of sulphur, but it is too destructive to the articles subjected to it to be recommended for general use.

**Bromine.**—Bromine gas is still more destructive than chlorine, and the disagreeable and dangerous character of liquid bromine renders it unsuitable for the hands of the public.

**Formaldehyde.**—The experiments made with it in the past few years and the succeeding practical experience in disinfecting work, have shown that formaldehyde gas has advantages
over sulphur fumigation or any other gaseous agent. Compared with sulphur, formaldehyde is a more efficient germicide, it is not poisonous, its odor is not so disagreeable, it does not escape from rooms so rapidly as sulphur dioxide, and it has a somewhat greater power of penetration. In ordinary room disinfection it should not be expected to act further than as a surface disinfectant. In small rooms or disinfecting chambers practically gas-tight, with the pieces to be disinfected well separated from each other and with large quantities of formaldehyde, the penetration of the gas is facilitated, and clothing, bedding, etc., may be disinfected with some degree of certainty.

In the disinfection of rooms with formaldehyde, fireplaces, ventilating flues, and other openings must be closed. The rooms should otherwise be made as tight as possible and then they should be flooded quickly. When formaldehyde lamps are used, a pint and a half of wood alcohol to each 1,000 cubic feet of space should be changed to formaldehyde within an hour and a half, and the rooms should be kept closed eight hours or longer.

In the forms of apparatus which volatilize the 40 per cent. solution of formaldehyde, 250 cubic centimetres for each 1,000 cubic feet should be used, and the rooms should be kept closed for the same length of time. Formaldehyde obtained by the volatilization of paraform is just as effective, but costs more. In small enclosed spaces 2 grams should be used for each cubic metre of space, or 30 grains to each 35 cubic feet.

Various uses may be made of solutions of formaldehyde. A 2 per cent. solution (Solution 7) may be used for washing infected surfaces, or for the disinfection of clothing or other articles that may be immersed in it. In gas-tight caskets or other small enclosures, articles may be disinfected by pouring in with them upon a cloth to absorb it, formalin, or a mixture of formalin, 1 part; wood alcohol, 1 part; and water, 2 parts. The requisite quantity of formalin is 1 ounce to each cubic foot. Clothing may be disinfected by spraying or sprinkling with solution of formaldehyde and then wrapping it in oilcloth or a rubber blanket. Formalin is the proprietary name of the 40 per cent. solution of formaldehyde, which can be more cheaply bought under the name of solution of formaldehyde as put up by some reputable American manufacturers.

Disinfection with Physical Agencies.—A large part of the work of disinfection can and should be done with heat (boiling and steam) as certain, economical, and almost always available, and with sunshine as an auxiliary.

Dry Heat, exemplified in the hot air disinfectors, is untrustworthy and is now but little used.

Boiling for half an hour is a sure way of disinfecting cotton or linen clothing or anything else that can be subjected to this process. Infected material and infected things generally are
disinfected more quickly by boiling than with steam disinfection.  

Steam Disinfection.—Steam disinfection has the advantage of wetting the goods less than boiling. The mistaken notion is too prevalent that pressure steam is essential to success in steam disinfection. The saving of time is an advantage of using steam under pressure, but for small places the cost of pressure steam apparatus is out of the question. Effective work can be done with flowing steam not under pressure, and in quite cheap disinfectors. The main requisite is an abundance of live steam streaming through the disinfecting chamber and the enclosed clothing or bedding.

When steam at a pressure of from 5 to 40 pounds is available at a factory or other source, it may be carried into a stationary disinfecting chamber which can be built at small cost. The State Board of Health will be glad to advise local boards who are interested in this direction.

A portable steam disinfecter may be ordered as follows at a tinman’s: Make it of galvanized iron plate like a common tin wash boiler, only have it 22 inches square and 30 inches high. Upon the sides, five inches from the bottom, have brackets attached for the support of a false bottom. This false bottom may be made of heavy galvanized iron perforated with ten or twelve half-inch holes. It should be supported in the middle by a cradle made of galvanized iron wire, or galvanized iron plate, removable for convenience when wiping and drying the bottom. The side brackets for the support of this false bottom should be attached with rivets, so they will not come off if the heat strikes them above the surface of the water, as they might possibly, if used over an open fire outdoors. The part of this steam disinfecter beneath the false flooring must be perfectly water-tight; slight leaks in the part above, which is to be filled with steam, are of not so much consequence. Two strong handles should be placed 18 inches from the bottom on opposite sides. Have two half-inch holes in the cover for the escape of steam.

When using this steam disinfecter put three inches of water into it, put in the false bottom, and above that pack in rather loosely the clothing to be disinfected; put the cover on tightly and steam one hour after the water begins to boil, keeping the water briskly boiling all the time. Many kinds of clothing that would be injured by boiling can be disinfected in this way without injury.

After the steaming, the apparatus should be carried into the open air immediately, and the clothing should be thrown over a line. Usually clothing thus treated is not very wet, and will dry in a few moments if spread out in the open air while hot.

This apparatus can be used in most cases upon the cooking
stove, taking off four covers. If in cold weather it is used outdoors or in an open room, steam would be wasted by the rapid condensation upon the walls and the disinfection might be a failure. An abundance of steam must stream through the disinfector the whole hour.

Steam disinfection on a small scale can be done in the common tin wash boiler by supporting a false bottom or floor of laths or thin board above the water with two bricks or otherwise.

Sunshine.—Most disease germs are killed by the action of direct sunshine, but as diffused light acts slowly and not with certainty, this disinfecting agency is limited in its applicability. The complete disinfection of rooms and their contents cannot be attained by the admission of sunlight even when aided by thorough airing. About the only practical use that can be made of sunlight in the work of disinfection is the carrying of upholstered furniture and sometimes other things out into the direct sunshine for several days after they have been otherwise disinfected as thoroughly as possible, and a doubt still lingers as to the completeness of their disinfection. It must be remembered that the sunshine must reach all their parts and that the action of light penetrates but little beneath their surfaces.

**DISINFECTING SOLUTIONS.**

**Solution 1.** For clothing, woodwork, floors, leather, excreta in the sick-room, sputum, the hands, the person.

**Solution 2.** For the same general uses as Solution 1. It is a little more efficient than Solution 1; but more likely to injure colors.

**Solution 3.** For tuberculous sputum, discharges in the sick-room.

**Solution 4.** For excreta, privy vaults, cesspools, etc.

**Solution 5.** For the same purposes as Solution 4.

**Solution 6.** For clothing, the hands, and the surfaces of walls, floors, furniture, etc.

**Solution 7.** For clothing, the hands, etc.

**Solution 1.**

Carbolic Acid (pure liquified),
Water, 7 ounces.
1 gallon.

Mix. This is approximately a 5 per cent. solution. Its power is somewhat increased by the addition of from 12 to 14 ounces of common salt to each gallon when used for the disinfection of excreta, or for other uses where the salt is not objectionable.

For the disinfection of clothing this solution mixed half and half with water will do.

**Solution 2.**

Lysol, 5 ounces.
Water, i gallon.

Mix. This may be used as a substitute for Solution 1, one-half the strength sufficeing for uncolored clothing. Many colors are changed by it.

**Solution 3.**

Solutol (crude or pure),
Water, 1-2 pint.
2 or 3 gallons.

Mix. This is a very efficient disinfectant for excreta, tuberculous sputum, and gross disinfection generally. If to be used in dwelling houses, or wherever the odor of the crude product would be offensive, pure solutol should be used.

**Solution 4.**

Chloride of Lime,
Water, 6 ounces.
1 gallon.

Mix. This is about a 3 per cent. solution. (Decolorizes and destroys fabrics).
SOLUTION 5. "Milk of Lime."

Slake a quart of freshly burnt lime in small pieces with three fourths of a quart of water—or to be exact, 50 parts of water by weighth with 100 of lime. A dry powder of slaked lime (hydrate of lime) results. Make milk of lime not long before it is to be used by mixing 1 quart of this dry hydrate of lime with 4 quarts of water.

Air-slaked lime is worthless. The dry hydrate may be preserved some time if is enclosed in an air-tight container. Milk of lime should be freshly prepared, but may be kept a few days if it is closely stoppered.

SOLUTION 6.

Corrosive Sublimate, 1 dram.
Water, 1 gallon.

Mix and dissolve. Label, Poison! This is approximately a 1:1000 solution. One ounce of this solution contains very nearly half a grain of corrosive sublimate.

SOLUTION 7.

Solution of Formaldehyde (Formalin), 6 ounces.
Water, 1 gallon.

Mix. This mixture contains a little less than 2 per cent. of formaldehyde.

APPLIED DISINFECTION.

In the disinfection of infected rooms and their contents the work cannot usually be well done with a single disinfecting agent or disinfecting process. Special disinfectants and special processes must be employed for special purposes. Thorough work, however, may be done even when the means at one’s disposal are but few and simple, but the expense involved in washing the paper from the walls of an infected room will often be more than the cost of the apparatus for using formaldehyde, and the portable steam disinfecter may save many times its cost in a single month. These two—formaldehyde and steam disinfection—should be available in every town.

In disinfection it should be remembered that the success of the work is influenced by:

1. Temperature. Disinfecting solutions generally act more efficiently when they are used warm or hot. A somewhat elevated temperature in a room increases also the activity of formaldehyde when used for its disinfection.

2. Time. This is an important element in disinfection. In the treatment of the discharges in the sick-room or of tuberculous sputum, for instance, disinfecting solutions should act several hours.

3. The quantity of the disinfectant. The volume of disinfectant used as compared with that of the infectious material is often much too small. In the following paragraphs note the directions which relate to temperature, time, and quantity.

Infected Houses.—At the beginning and during the whole course of a case of infectious disease, the family and the attendants on the sick should be under instructions as follows so that as small a part of the house as possible may become infected:

Everything not absolutely needed in the sick-room should be removed from it before the patient is carried to it, or before these superfluous things have become infected. This should
apply particularly to carpets, draperies, upholstered furniture, and other things disinfected with difficulty.

All the patient’s bed and personal clothing should be disinfected as soon as it is removed.

Every other article carried from the infected room should be disinfected then and there.

Rooms.—In the disinfection of rooms the fact should be kept in mind that the chief task before us is the destruction of infectious dust. In every movement, therefore, we should be on our guard against the danger of whisking it into the air or diffusing it through other rooms.

Before the disinfection of the rooms themselves is begun, a preliminary sorting out should be done. Some things, clothing and some or all of the bedding particularly, should be removed for separate or special treatment. (See “Clothing,” “Bedding,” etc.) In the disinfection of rooms, one of two processes may be employed:

1. Disinfection with formaldehyde is by far the most convenient. Properly used it can be trusted to disinfect the exposed surfaces of walls, floors, furniture, etc., and the infectious dust of the room. If there is a probability that infectious sputum has been dried upon walls, floors, or furniture, as is very likely to be true in some cases of diphtheria, scarlet fever, or consumption, the disinfection of the surfaces thus probably soiled is facilitated if they are washed or sprayed with a 2 per cent. solution of formaldehyde (Solution 7) before the disinfection with formaldehyde gas is begun. (See “Formaldehyde.”)

2. If formaldehyde disinfection is not available the next most trustworthy process is washing all surfaces with a disinfesting solution (Solution 1, 2, 6, or 7). Floors, particularly, should receive careful treatment and the solution should reach and wet the dust and dirt in the cracks. The ceiling may be brushed with a damp cloth to remove infectious dust and stray cobwebs. The walls should be wiped carefully with a sponge or cloth squeezed out of a disinfesting solution. When the walls are papered, it will be a case of injured walls or incomplete disinfection. The local board or the owner must decide.

With the cloth dampened in the solution wipe the dust carefully from all horizontal or other surfaces that can harbor it, furniture, moldings, doors, windows, etc. (See “Furniture.”)

Cotton and Linen Clothing.—The most trustworthy agency for the disinfection of clothing generally is moist heat,—steam or boiling. Steam disinfection wets the goods less than boiling, does not shrink woolens so much, and is less likely to change the colors of fabrics. Boiling for one-half hour insures the disinfection of all clothing thus treated.

When infected bed or body linen is removed, it may be treated differently according to circumstances. If stained, it should be soaked some hours in a disinfesting solution at a tempera-
ture not exceeding 120° F. For this purpose Solution 2, half strength, is especially appropriate as having the properties of a soap and a disinfectant; or Solution 1 mixed with an equal quantity of soap and water, may be used. Subsequent boiling, as in the ordinary laundry processes, will complete the disinfection. Unstained clothing may be immersed in Solution 1, 2, or 7, one-half strength, or in Solution 6, and then treated as already advised, or it may be transferred immediately to the wash boiler or steam disinfector. If Solution 6 is used, the clothing should be taken from it and well rinsed before it is transferred to the wash boiler.

Clothing which has been immersed in the disinfecting solution, or is otherwise wet, is not readily penetrated by the heat in steam disinfection. In transferring infected clothing from the sick-room, it should be wrapped in a sheet wet in a disinfecting solution or in simple water if the disinfecting solution is not at hand. Infected clothing should never be sent to public laundries.

Woolen Clothing.—Disinfect with steam when available; when not, in solutions as under “Cotton and Linen Clothing,” or with large doses of formaldehyde in small, tight, enclosed spaces. (See “Formaldehyde.”)

Bedding.—When steam disinfection is available, quilts, comforters, blankets, pillows, etc., should be treated in it, and mattresses also if the apparatus is large enough. In the absence of a steam disinfector, proceed as follows.

A. The room is to be disinfected with formaldehyde.

Even if formaldehyde is to be used, counterpanes, quilts, comforters, blankets, sheets, and pillow-cases should be removed for steam disinfection in the wash boiler, or in Solution 1, 2, 6, or 7. If these articles of bedding are left in the room their disinfection with formaldehyde will be uncertain, and the same will be true of that part of the surfaces of furniture and floors covered by them.

Disinfect pillows and feather beds with steam in the wash boiler or with large doses of formaldehyde in small enclosures that are practically gas-tight, as a small closet or tight dry goods box pasted if necessary, or an oilcloth bag. (See “Formaldehyde.”)

Leave mattresses upon the bedstead wholly exposed to formaldehyde when the room is disinfected. If the mattresses have been soiled by the penetration of discharges, as sometimes happens in cases of typhoid fever, the owners should be advised to burn them. The only safe alternative is the injection of large quantities of formaldehyde (the gas or formalin) into their interiors while they are enclosed in a gas-tight covering.

Mattresses of but little value should be burned if the facilities for their sure disinfection are not at hand.
The contents of straw beds should be burned. The ticks may then be disinfected as for clothing.

B. The room is not to be disinfected with formaldehyde.

Proceed as in A with the exception that the surfaces of bed mattresses should be washed with a sponge or cloth squeezed out of Solution 1, 2, or 6.

When practicable the removal of the larger pieces of bedding should be through a window into the open air instead of through other rooms.

_Furniture._—The rules may here also be arranged under two subheadings.

A. Formaldehyde is to be used. Then simply leave all pieces of furniture in the room, all their parts well exposed to the action of the gas. 

B. Formaldehyde is not available. The disinfection must then be done with disinfesting solutions (Solution 1, 2, or 6). Dip a large, soft sponge or cloth into the disinfesting solution and, squeezing it out more or less according to the nature of the articles to be disinfected, wash or wipe carefully every part of the surface of the woodwork of furniture, its upholstered parts, leathern, glass, or metallic* articles, and toys. Toys of little value should be burned. Upholstering and the unfinished backs of furniture should be thoroughly washed. Pictures covered with glass may be rubbed with a dampened cloth. Uncovered pictures should be wiped with a soft, dry cloth. All parts of furniture where dust has lodged should receive careful and thorough treatment.

After this treatment upholstered furniture should be carried out-doors and exposed to direct sunshine several days.

_Rugs and Carpets._—Disinfect rugs with steam or with formaldehyde as under _"Bedding—A."_ Fur rugs must not be subjected to steam.

If, unfortunately, a carpet was left upon the floor of the sickroom it should be removed before the room is disinfected and treated as follows:

A. By steam disinfection if a steam disinfecting chamber of ample size is available.

B. If steam disinfection is not available, subject it to formaldehyde as under _"Bedding—A."_

C. If neither steam nor formaldehyde can be used, spray or sprinkle the carpet upon both sides until it is thoroughly wet with Solution 1, 6, or 7. Besidess these processes the only safe alternative is burning and this is advisable for rugs and carpets of little value.

_Furs, Skins, Etc._—These can be efficiently disinfected only with formaldehyde as under _"Bedding—A,"_ or by spraying or sprinkling very thoroughly with a disinfestting solution.

*Solution 6 should not be used on metallic or gilt articles.
Boots, Shoes and Other Leathern Articles.—Wash in Solution 1, 2, 3, or 6, or expose to formaldehyde.

Excreta.—In the sick-room the discharges from the bowels may be treated with any of the solutions given in this circular save Solution 6 and 7. Solution 3, 2, or 4 is slightly preferable when obtainable.

Disinfecting solutions should act three or four hours at least. A still longer time is better. The quantity of 1, 2, or 3 used should be at least twice the volume of the discharge. If 4 or 5 is used the quantity should be much larger. The intimate mixture of the disinfecting solution and the material to be disinfected is important.

A sure way to disinfect fresh excreta is to pour upon it in the vessel at least four or five times its volume of boiling water, to cover the vessel, and to let it stand until cool.

Privy Vaults.—Disinfect with Solution 4 or with “milk of lime” prepared as whitewash is made, or as is directed for Solution 5. It should be used in large quantity sufficient to saturate thoroughly the contents; and after the vault is emptied, gallon after gallon should be poured in until the ground beneath the privy is thoroughly saturated with the milk of lime.

Cesspools.—Disinfect as under “Privy Vaults.”

Water-Closets.—If they have received infectious discharges the bowls should be scrubbed out with Solution 1, 2, or 3.

Sputum.—Fresh tuberculous sputum is hard to disinfect. It may be received on pieces of rag or paper and burned. In spittoons it may be disinfected with Solution 2, 3, or 1. The efficiency of these solutions is increased by using them hot, and that of Solution 1 by acidifying it with hydrochloric acid (2 ounces to 1 gallon of the solution) or by the addition of common salt (12 to 14 ounces.) These solutions should act twenty-four hours. This necessitates several spit cups or spittoons for the patient.

Tuberculous sputum may also be disinfected by filling the spittoon with boiling water, covering it, and letting it stand until it is cooled. The cleansing of the spittoon is facilitated by the addition of washing soda before the hot water is poured in.

The treatment of other infectious sputa should be the same as that of tuberculous sputum.

Corpses.—Wrap in a sheet wet in Solution 6, 7, or 2, and bury as speedily as possible.

Mouth and Throat of Nurses and Attendants as a Prophylactic.—Rinse in a 1 per cent. solution of formalin, or five drops of formalin in one ounce of water.

Clothing of Nurses and Physicians.—Steam is preferable. For the physician’s suit, two or three ounces of formalin may be poured on a rag beside it in a tin wash boiler or gas-tight box of about the same size. Close tightly. Leave over night. It cannot be worn until thoroughly aired.
NOTES, SANITARY AND OTHERWISE.

The late irregularity in the appearance of the Sanitary Inspector is regretted, but the claims of the other office work have made it unavoidable.

The Fifth Report on the Births, Marriages, Divorces, and Deaths in the State of Maine was received from the binder some time ago. The number of copies printed does not admit of a general distribution of this report, but a copy will be sent to each applicant.

The Tenth Report of the State Board of Health, now nearly ready for distribution, is largely devoted to disinfection. Besides the second report of Prof. Robinson on Formaldehyde, it contains the new "Circular No. 68, Disinfectants and Disinfection," and a paper entitled, "Notes on Disinfectants and Disinfection," which constitutes a fuller presentation of the work done in the last twelve years or more than is elsewhere available. It is hoped that this report may be helpful to public health officers, physicians, and future investigators.

Following the publication of "Circular 68, Disinfectants and Disinfection," new editions of the circulars on diphtheria, scarlet fever, and typhoid fever have been prepared, printed, and sent to all of the local boards of health. These are known as the "Edition of 1898." Copies of the old circulars on hand should be destroyed and the rules for disinfection given in the new circulars should be followed.

The unfortunate prevalence of typhoid fever in our military camps is a shame and a reproach to the nation. It is not a reproach to sanitary science, but apparently to faulty military systems and to those persons whose duty it was to apply the well established principles of sanitation and who did not do so.
It is too early equitably to parcel out the praise and the blame for the conduct of the war, but it is apparent that some sweeping changes are required in our military service. Men, whether brigadier-generals or non-commissioned officers, who have no comprehension of the trite fact that preventable diseases are far more dangerous to their men than are military projectiles, and who are ignorant of even the rudiments of the art of protecting their men from the greatest dangers they encounter in war, are not suitably equipped as commanders.

As to the medical arm of the service, the extended experience of Surgeon-General Sternberg as a surgeon in the regular army and his varied scientific attainments eminently fitted him for the place. He had for many years taken a prominent part in the investigation of the causes of those diseases which, uncontrolled, decimate civil and military populations, and in studying practical methods of controlling them. So far as the essential principles were strictly applied which he and numerous collaborators had worked out, the results appear to have been admirable.

In the field in a tropical climate, and under circumstances rendered adverse, apparently by no fault of the medical service, the instruction of the rank and file in the first principles of antisepsis, and the strict application of antiseptic methods to operative surgery, gave a remarkably low death-rate among the wounded. Pestiferous Santiago also, after the American occupancy, under a military commandant who was a practical physician, gave a pleasing example of the value of sanitation. The maintenance of the health of the navy, though under another service, is a striking example of the beneficence of enforced sanitation.

But in the military camps in our own country the condition of things was not so satisfactory. Something was wrong. One thing is certain; that many of the medical men employed, efficient and devoted surgeons though they were, had not had the special training in military hygiene that is essential to the army surgeon. Did all of these men receive precise, printed directions regarding the disinfection of typhoid fever and dysenteric discharges, the construction and management of sinks, the sterilization of drinking water, etc.? If not, they should have had them, and at every
At Camp Powers in this city some of the conditions under which the surgeons and their men were placed were unfavorable. The construction of the permanent sinks was faulty, and they were much too near the kitchens and mess-rooms. Furthermore, the prevailing westerly winds favored the transit of unpleasant odors and excreta-laden flies to the kitchens and the mess-rooms. Though the discharges of the hospital patients did not reach the company sinks, there was abundant opportunity for their infection by men in the preliminary stage of typhoid fever and by "walking cases" of that disease before these cases had come to the attention of the surgeon. It is probable that the myriads of flies had much to do with the outbreak of typhoid fever in the batteries. Spring water which has always been good was used at Camp Powers. In the city there have been but very few cases of typhoid fever not referable to the camp.

Some much needed changes in the sanitary management of the hospital were promptly made by Adjutant-General Richards after the return of the troops from Chickamauga, but the means and the authority were wanting for making other improvements which should be made.

This journal has repeatedly called attention to the danger of transmission of infection by flies, and has given abstracts of investigations which show that the infection of various diseases may be carried upon the bristly feet of flies or pass their intestinal tracts with unimpaired vitality. The governmental commission, therefore which found in their report that flies were the principal agents in the transmission of the infection of typhoid fever at Chickamauga, and other military camps, had the support of some previous findings in that direction, though the investigations, hitherto, have related to the communication of other diseases,—cholera, tuberculosis, small-pox, and plague.

The prevention of typhoid fever may tersely be stated as consisting in guarding against the use of polluted and infected
drinking water, and in the prompt and certain disinfection of the discharges from typhoid fever patients. But the carrying out of what is here implied requires constant vigilance and close attention to details. In the disinfection of typhoid excreta, for instance, the first point is to choose a disinfecting agent known to be an efficient destroyer of the typhoid germ in the medium in which it usually exists. A second point is the intimate mixture, by stirring or otherwise, of the disinfecting solution and the matter to be disinfected. A third essential point is that the disinfectant must have time enough to act, more time, in fact, than most physicians and nurses give it. (See Circular No. 46 and No. 68.)

Dr. Snow of London first pointed out the fact that cholera is a water-borne disease. By teaching that so long as people drink pure water they will not have cholera, he has saved millions of lives. If, as Sir Richard Quain said, Dr. Snow had been a soldier instead of a doctor and had slain his thousands, instead of saving his millions, he would have been hailed as a hero and his memory would have been honored with monuments more enduring than brass.

The habit of going to bed in a hotel or elsewhere with the gas burning is a dangerous practice. If on account of the formation of moisture in the pipe, or otherwise, the flame should be extinguished, the unconsumed gas flows into the room with deadly results, mayhap. The accidental leakage of illuminating gas is much more dangerous than formerly where “water-gas” has been introduced.

I believe that, as concerns the future of our women, they would do far better if they were more lightly tasked, and the school hours but three or four a day, until they reach the age of seventeen. Anything, indeed, would be better than the loss of health, and if it is a question of doubt, the school, unhesitatingly, should be abandoned or its hours greatly lessened, as, at least in part, the source of very many of the nervous maladies with which our women are troubled.—Dr. Weir Mitchell.

A correspondent in Augusta, Georgia, says that while the prevalence of consumption is diminishing in the northern cities, it is increasing in his city. Does not this and the other fact that
appeal is often made from the citizens of Georgia for the circulars of the State Board of Health of Maine, indicate the need of the influence and help of a state health department there?

No child is well of diphtheria so long as there are discharges from the nose, ears or mouth, and so long as these continue it should not go to school or mingle with other children. No child suffering with a cold, sore throat, or cough, should ever be neglected. Sore throats are often mild forms of diphtheria. Persons inserting notices of deaths resulting from this disease in newspapers should announce “Of Diphtheria” in order that all who have children may be warned to remain away from the house.—Circular of Penn. Board.

The monthly report of the Board of Health of Denver, Colo., contains a table which shows the following interesting facts: Before the introduction of antitoxin in 1895, the percentage of deaths among cases of diphtheria ranged from 28.7 to 46.5 in the six preceding years. In the three years 1895-97 the percentage of deaths for the cases of diphtheria treated with antitoxin averaged 6, and for those which did not have antitoxin it was 19.5.

To Town Clerks and Local Boards of Health.—See second and third pages of cover.

SUNSHINE AS A DISINFECTANT.

The work of many investigators has clearly established the fact that direct sunlight has a powerful disinfectant action. The infectious agents of tuberculosis, diphtheria, typhoid fever, cholera, and even bacteria so hard to kill as that of the germ of suppuration and anthrax spores are rapidly destroyed when exposed to the action of direct sunshine. Disregarding the question of the direct revivifying influence of light, sunshine is an important element of salubrity. Those regions of country with comparatively little cloud, fog, and smoke are less troubled with consumption, other things being equal, because, for one reason, the bacillus of tuberculosis is rapidly destroyed by the great abundance and intensity of the sunshine. For the same reason homes around which sunshine has free access, are less likely to become “phthisis nests.”

Esmarch’s careful experiments demonstrated that the disinfecting rays of the sun penetrated several layers of white linen
or cotton cloth and destroyed the easily-killed bacillus of cholera in from one to four hours. Under the same conditions the bacillus of diphtheria was destroyed in 5 hours, but the germs of suppuration remained alive after 6 hours exposure. In the interiors of cushions, mattresses, etc., prolonged exposure to the action of the sun was powerless to destroy the diphtheria bacillus. "These and other experiments convince Esmarch that in the action of the sunlight we have no trustworthy means of disinfecting. When we can assume that the pathogenic germs are upon the surfaces of articles, as in most cases of diphtheria, it would suffice to expose the articles to the action of the sun for a few hours; but when, in cases of cholera or typhoid fever, the dejections of the patient may have penetrated to the interior of mattresses the action of the sunshine cannot be trusted."

Other investigators conclude that, while direct sunlight rapidly destroys infectious germs when well exposed to the rays of the sun, it can be trusted only to disinfect the surfaces of articles. It has also been determined that the disinfecting action of sunlight does not extend far below the surface of water or sewage, the limit of effectiveness being influenced by the degree of transparency of the liquid.

DOES FORMALDEHYDE DISINFECT?

The answer to this question depends upon what you propose to disinfect. The many long series of experiments which have been carried out in Europe and America for the purpose of determining the right answer to this question have shown very conclusively that formaldehyde is a very powerful germicide. The only solicitude in the minds of those who have given it the most careful study is that some persons may expect it to do what no person could expect it to do who has an intelligent idea of the limitations of gaseous disinfection.

In the Medical Record for April 2, Dr. G. W. Goler, Health Officer of Rochester, N. Y., narrates briefly four experiments made in the laboratory of the Rochester health department. They consisted in exposing to formaldehyde in a room cultures of diphtheria bacilli in tubes and in open Petri dishes, and a quantity of sputum containing tubercle bacilli in a shallow wide-mouthed bottle. It would seem that no person who has carefully looked over the literature relating to formaldehyde could for a
moment expect positive results,—that is, the sterilization of the material exposed. And yet because it is not sterilized, the author is led "to believe that the value of formaldehyde as a disinfectant, with a sufficient penetrating power thoroughly to disinfect in practice, has not yet been proven."

One thing has been proved and that is that formaldehyde gas, properly used, is a trustworthy disinfectant for surfaces and for the infectious dust of rooms when these are freely exposed to it. It will do this work more rapidly and surely than sulphur fumigation, and will leave articles uninjured, and will not endanger and annoy persons in other parts of the house. This has been demonstrated again and again by many workers whose experiments are counted by hundreds instead of by fours and fives.

The experimental work done for the Supervising Surgeon-General of the Marine Hospital Service, for the Department of Health of New York City; and for the Health Officer of the Port of New York shows also that, in a small gas-tight disinfecting chamber, with the vacuum system, formaldehyde gas rapidly penetrates and disinfects clothing and other articles; while Robinson, and others find that used in large doses in small gas-tight enclosures without the vacuum system the power of penetration of the gas suffices to render it of value for various special purposes. But no person well informed and sane should hope to disinfect a sick-room with all its contents of bedding, clothing, carpets, and furniture with formaldehyde gas. It truly lacks sufficient penetrating power for this. This expectation of "a sufficient penetrating power" is an ignis fatuus which leads to sham work, or the rejection of a truly valuable disinfectant in its legitimate sphere.

Some of the reasons why Dr. Goler's experiments could not be expected to give positive results are these. Though the experiments of some of our most trustworthy investigators indicate that bacteria upon damp surfaces, or in porous fabrics are as readily destroyed as if they were dry, fluids, semi-solids, and wet solids, so far as my memory of experimental results goes, are not readily penetrated by formaldehyde gas. Formaldehyde gas is not an appropriate disinfectant for those kinds of material in bulk. Robinson found that the germs in liquids are not killed to any great distance below the surface. Ivanoff's experiments showed him that formaldehyde penetrates organic tissues but
slowly, and Burckhard found that formaldehyde mummifies animal tissues so far as it acts, but it does not penetrate far. Some investigators have found that test organisms in open tubes are not killed when others of the same kind are completely sterilized when freely exposed. A free exposure to the movements of the gas and the air appears to be essential to certainty of disinfection.

On the other hand, the experiments of Professor Robinson for the State Board of Health of Maine and those of Dr. Novy for the State Board of Health of Michigan, as well as others that might be cited, show that dampness, or fluids in thin layers, are no hindrance to the disinfectant action of formaldehyde gas.

Dr. Goler complains that most of the laboratory experiments with formaldehyde have been made upon dry cultures, and fears that formaldehyde will fail to act upon places that have been scrubbed with soap and water. Dry cultures represent the condition of the infectious material, mostly in the form of infectious dust of the air, the walls, the floor, etc., with which we have to deal in real disinfecting work. Sputum is burned or disinfected with solutions. Clothing and bedding should be disinfected with steam and disinfecting solutions. The walls and floors of rooms which have been occupied by careless or uncontrollable diphtheria or consumptive patients should, as recommended by Rosenberg, Rideal, and others, be washed or sprayed, with a solution of formaldehyde.* That will soften dried albuminous matter and sterilize it or facilitate its sterilization by the gas subsequently used.

As to Dr. Goler's one experiment with sulphur fumigation, we would refer him to the extensive series of careful experiments made by Dr. Novy of Michigan, which show the great superiority of formaldehyde over sulphur dioxide whether the infectious matter is dry or damp.

One erroneous method of testing the value of formaldehyde should be noticed. Because flies, moths, and buffalo bugs survive an application of formaldehyde gas, it should not be inferred that it is of doubtful utility in destroying disease germs. The preponderance of testimony is to the effect that formaldehyde

* A 2 percent. solution of formaldehyde (5 per cent of formalin) is recommended by the State Board of Health of Maine for this purpose.
gas is but slightly toxic to animal organisms, whether the higher or the lower forms, but that of those lower forms of the vegetable kingdom,—those one-celled plants which we call bacteria,—it is an efficient destroyer.

RESOLUTION ON TUBERCULOSIS.

At the thirteenth annual meeting of the conference held in Detroit in August, the following resolution was adopted:

"Whereas, It is the unanimous voice of the Conference of State and Provincial Boards of Health of North America, that, since tuberculosis which causes on this continent, more deaths than all other contagious diseases together, is now recognized by all scientific and medical authorities as both curable and preventable, and

"Whereas, Since the onset of the disease depends especially upon hereditary weakness, and on malnutrition induced by overcrowding, bad ventilation, and overpressure in school, social, and commercial life; and

"Whereas, Since the presence in the homes of the poor of so many cases of this chronic disease means about certain death to the patient, and probable infection of other members of the family, be it therefore,

"Resolved: That this Conference does publish, and instruct the Secretary to forward copies of these resolutions to the Legislatures, Departments of Education, and Municipal authorities, of the several States and Provinces represented in the Conference, urging upon them the imperative need of,

"1. Having all schools and colleges placed under medical supervision with regard to ventilation, overcrowding and overpressure in studies;

"2. Having all hotels, boarding houses and workshops where consumptives may be employed placed under municipal supervision and inspection;

"3. Urging all state legislatures to devote public funds, and encouraging private philanthropy, in the establishment of homes or sanitaria in one or more counties or districts of the several states and provinces to which patients may be sent early, either at their own or municipal expense, and under proper regulations be encouraged to remain therein until recovery shall have taken place, while at the same time, they shall have prevented the continuance of centers of infection in their homes."
THE DISTRIBUTION OF INFECTION.

The following extracts are from an address on the Physical Laws which Govern the Distribution of Infection, made before the last meeting of the Congress of the British Institute of Public Health by Dr. J. B. Russell, President of the Preventive Medicine Section.

"These laws have a very direct bearing on our interpretation of sundry phenomena of infection, and consequently upon preventive precautions. If you find evidence that a disease, say Scarlet Fever, or Diphtheria, has taken up its residence—so to speak—in a room after the patient has left it, look for your enemy under the disguise of dust. If you hear of washerwomen being infected, ascribe it to the dust of the soiled clothes, given off in their sorting and distribution previous to being washed, not to microbes being borne up in their faces with the steam of the washing-tub. Indeed, take it as a universal rule, the remembrance of which may confer great peace of mind where vague ideas of infection would tend to hysterical excitement, that microbes under water, or involved in a thoroughly damp substance, are scotched if not killed. We can look at the liquid with equanimity. It may stink, and if we are foolish enough to keep it beside us, it may depreciate our health; but unless we soil our hands with it, and so convey it to our mouths, or pour it into the drainage area of our wells and drink it, or dip a sheet in it, and dry the sheet and scatter the dust within our breathing area, it cannot infect us. So with the damp substance. It will sooner reach the condition of dust than the liquid; but, until then, it is innocuous. The inference is a very obvious one, that if the contagia are so effectually drowned and put beyond the possibility of doing harm when either damped or immersed in a mass of liquid, then we have in this expedient the readiest way of making them temporarily innocuous. If mud is harmless so long as we prevent it from becoming dust, then if, whenever we encounter dust we make the dust again into mud, we shall make it again harmless. This is the principle upon which the Bradford manufacturers deal with that most virulent and typical dust disease, Anthrax. Before long disturbed, the bale of foul hair is carefully immersed in water; it is allowed to soak, and the bale is loosened out so that the water may gain access to the very heart. The workers are not allowed to touch the hair until the
bacillar dust is wet, and they are required to tease and sort it out while it is damp. In this way the dust is turned into mud, and this dangerous process is conducted in safety. In like manner if, instead of pitching infected clothing and changes of bed linen into the dirty clothes basket, where moist stains soon become dry; if, instead of tossing infected articles about on every occasion of handling them, we disturbed them as little as possible, and quietly and promptly plunged them into a tub of water, we might take our leisure about future processes. The infection is harmless not merely so long as the articles are beneath the water, but after they are wrung out of it, so long as they are damp. As to the infective flotsam and jetsam of the air, the dust of apartments which have been inhabited by the infectious sick, I remind you of the principle adopted in the construction of hospital wards and operating theatres—viz., to have as few horizontal surfaces as possible; to have them as smooth and hard as possible, and to make the whole interior of such material that every part of it can be thoroughly hosed down at will. This is again the process of making dust into mud, and if we spray the water through the air we merely imitate one of nature's processes for atmospheric disinfection—the rain. Dust and air infection are reciprocals. The air of a room may be disinfected by simple subsidence. It has been suggested as a part of the process of disinfection of apartments to shut up all doors and windows and keep the air quiet for twenty-four hours. Yet the room is not thus disinfected. You must quietly capture and drown the dust. If you throw open doors and windows, toss about bedding, move furniture, bustle over the place with whisks and dusters, you merely chase the dust about and re-infect the air. I speak of dust in closed, inhabited spaces. In the open air that part of the dust which is living and dangerous need give us no further anxiety. Sunlight and rain will soon destroy it or drown it.

It seems to me that in dealing with infected liquids and with substances which are moist or can be moistened, we simply waste time in attempts to disinfect which are not only unnecessary but will, in all probability, prove futile. This is eminently true as regards everything of which the final and fit destination is the sewer. Nothing interested or delighted me more in all my reading regarding tuberculosis than the following passage in the report of the experts consulted by the Prussian Government:—

"The spittoon is to contain as much water as will not readily spill. The question which is frequently raised (as in the debate at Munich), whether the contents ought to be disinfected before being emptied out, we may answer in the negative. Chemical agents touch the masses of sputum only from the outside, merely coagulate the albumen and penetrate no further. Boiling water would be certain, but difficult to carry out. Therefore there is
nothing to be done but empty it down the drains or into the water closet, where the sputum remains moist, and, therefore, harmless."

Therefore, I say if discharges are fluid or moist to begin with get them by the shortest route into the sewer. Dust as dust is invulnerable. If you have to deal with dust turn it into mud and send it also to the sewers. I have no fear that any sort of disease-producing microbe after it once reaches the sewers will ever turn up alive again. Of course, if your sewers discharge into a potable river or your drains leak into local wells, you must take the consequences. All that can be said is that a few germs more or less will in that case make little difference in the results. Otherwise, for pathogenic microbes the sewer is the broad road which leads to destruction. They speedily perish amid the antagonisms, rivalries, and incompatibilities of nature, which after all are more deadly than all the purposive efforts of man. Imperfect chemical disinfection not merely fails to kill the microbes but it interferes with the operation of the organisms of putrefaction."

ANSWERS TO CORRESPONDENTS,

To a Local Board.—"A local board of health may quarantine a case of infectious disease whenever and wherever they know of it, irrespective of the advice of a physician. Of course, when a physician is attending cases, the local board of health should abide by the diagnosis of the physician, whether the cases are, or are not diphtheria. At any rate, that is the rule which should be followed generally."

Diphtheria in the Air.—"No, diphtheria will not go far through the air. If we can once get the infection outdoors into the free air, there is practically no danger, even if in places where houses are quite near together. Diphtheria is communicated by coming in contact or near infectious persons and things, or by going into rooms where the infection is enclosed or pent up."

Questionable Cases of Sore Throat.—"In questionable cases of sore throat, the family, local board of health, and the attending physician should be on the safe side by inculcating a reasonable amount of precaution against the spread of contagion. Some cases of sore throat called tonsillitis are cases of diphtheria. If tonsillitis, it is generally infectious, and as such should be excluded from the school. Some cases of simple sore throat are also masked cases of diphtheria. Some years ago physicians thought it a comparatively easy matter to pronounce with certainty between those cases which are diphtheritic and those which are not. Now the best authorities admit that it is impossible for even the most experienced and skilled practitioners to determine whether some of these cases are, or are not, diphtheritic, without such aid as comes from examinations in bacteriological laboratories."
NOTES, SANITARY AND OTHERWISE.

A few words for town clerks on second page of cover.

The law of France which forbids the feeding of solid food of any kind to infants under one year of age, without the written authority of a qualified medical man, is a reasonable provision for the preservation of the health of the infant population.

Another important matter in the hygiene of infancy is the abolition of the nursing bottle with the rubber tube. The tube cannot be kept aseptically clean and safe. The good work which Health Officer Wende, of Buffalo, has done in this direction was heartily approved by the American Public Health Association, though it was deemed best to leave it at present with local educational and prohibitory influences.

For the full comprehension of many health problems, it is desirable that the general public have a clear conception of that term, "aseptically clean." After attending to the wants of a typhoid fever patient the nurse washes her hands. They may then pass as clean, though they have not been freed from all of the germs of typhoid fever - with which they may have been infected. There is still a possibility that her hands may become the medium by which typhoid infection may be carried to her own mouth or to that of some other person. To render her hands "aseptically clean," or aseptic, the treatment by washing, or with disinfectants must practically free them of disease germs. Or in the case of the nursing bottle, all its parts must be freed from the germs of putrefaction and of disease.

Definitions for non-professional readers: *Sepsis.* A putrefactive condition, or infection by disease germs. *Septic.* Relating to putrefaction or infection. *Aseptic.* Free from septic
matter; free from bacteria which may start putrefaction or disease. Antiseptic. Preventing putrefaction or disease. An antiseptic agent is one which has the power of preventing the growth of putrefactive or disease germs. Disinfectants are agents capable of destroying bacteria or infectious matter.

Returning to the soap question, it may be said that there is a tendency to ascribe a greater disinfecting power to soap and water than is warranted by the evidence thus far produced. Soap and water when hot enough act efficiently, but at temperatures borne by the hands, or practicable in the washing of floors or walls, trustworthy disinfection cannot be expected from soap and water alone.

 Brother Probst of the Ohio Board should see to it at once that no more of his people conduct themselves so unpatriotically, even treasonably, as to masquerade in the habiliments of small-pox under the name of "Spanish Measles." In view of the recent escapades of the Kaiser and his brother it is bad enough to have German measles, but the Hidalgo variety—! Dr. Probst and President McKinley have our sincere sympathy. The good old fashioned English measles should do for us.

Mr. William Tebb, one of the leading antivaccinationists of England, is now on a visit to this country. His health is very poor, and we sincerely hope he will be vaccinated while here, recover his health, and be able to look at the vaccination question as the great majority of intelligent people the world over do.

Unless Mr. Tebb has recently been vaccinated, his friends should steer him clear of certain spots in this country which it would be perilous for him to visit. For instance, keep him away from Dr. Probst's Spanish measles cases. It was only last year that an antivaccinationist a little farther south, threw his life away, dying of small-pox, and communicated the fatal infection to another person.

Apparently with the idea of consistency, the antis denounce all kinds of vaccination, antitoxin, protective inoculation, serum therapy, etc., no matter how little they know of it, or how much others know of it. With them the million of lives already saved
with diphtheria antitoxin, the curing of that hopeless disease, lockjaw, with antitoxin, the saving of millions of dollars for the agricultural interests, the encouraging results in the prophylactic treatment of bubonic plague, the cheering prospect of successfully applying serum therapy to the treatment of many other of the worst of human and animal diseases,—all this goes for naught with a few persons whose mental machinery needs a balance wheel.

That outbreak of bubonic plague in Vienna which had its origin in the careless handling of the cultures of plague by one of the assistants in a bacteriological laboratory should be a sufficient answer to that out of date nonsense that the so-called disease germs are not the prime cause of disease, but that the only meaning of their presence is that the disease furnishes a congenial habitat.

A comical little antivaccination paper says that "disease germs only thrive where disease exists," nevertheless, various trustworthy observers have found the bacillus of diphtheria in the throats of perfectly well children of whom some had diphtheria a few days later after the germs had time to thrive and proliferate enough of their specific toxin to poison the system. Those who would teach the truth should say: Infectious diseases exist only where disease germs thrive.

On the next page we find: "Cholera and typhoid germs have been found where these diseases were never known." Of course they have; and Tom, Dick, and Harry have carried eggs into the woods where never a chick was hatched. That infectious diseases may develop, two things are required: the presence of the specific cause—the germ—and its reception by a susceptible person.

The latest reports from India indicate that Professor Haffkine's preventive inoculation against plague is a success so far as it can be applied. Among 3,814 natives who were inoculated, there were three deaths from plague; while among 9,516 not inoculated, there were seventy-seven deaths from the same cause.
Haffkine's report on the results of the inoculation of the inmates of the Byculla jail states that of the 345 inmates, 154 volunteered to be inoculated and were thus treated. In the six days before their inoculation, there had been 9 cases of plague of which 5 were fatal. In the six days after the next day after inoculation there were 12 cases among the non-inoculated, six of which were fatal, and but two cases among the inoculated, both of which recovered. Haffkine concludes that the time necessary for the prophylactic serum to exert its protective effect is very short, though it cannot arrest symptoms already started or that come within a few hours.

By a modification of the process of preventive inoculation against cattle plague (Rinderpest) which Koch's studies in South Africa developed, his pupil, Kohlstock, has been able to confer a permanent immunity upon the herds of the German colonies in Southwest Africa so that, in five months after the beginning of the inoculation, the business of the country was fully resumed with no recurrence of the disease. In one of the worst localities where the mortality among the cattle had been 95 per cent., from 75 to 95 per cent. of the animals were saved.

Dr. Walger has lately applied the serum treatment to four cases of typhoid. In all cases the injection of the serum was followed by a marked improvement in the condition of the patient and by a short duration of the fever.

The fair measure of success which apparently still accompanies Professor Sanarelli's prophylactic and curative treatment for yellow fever makes it evident that his work deserves a full and unbiased investigation. His previous record, as well as his present statements, entitle him to a respectful hearing, and this country can ill afford to be anywhere near the rear of the procession in learning the truth in this direction.

The United States yellow fever commission detailed by the President only a short time before the war to study yellow fever in Havana, reports preliminarily that the bacillus of Sanarelli is the specific agent in that disease, and that this bacillus and Sternberg's bacillus "X" are not identical.
In the report of the late Colonel Waring, he stated that Havana is "the worst case of filth and carelessness in a city that he had ever known of in his long experience with these matters." Not a trace of sewerage exists. For sewers, water-closets, and pavements, an expenditure of $20,000,000 is needed.

The last great epidemic of yellow fever was in 1878, when it invaded 132 towns of the United States, and caused a loss of 15,934 lives, and a pecuniary loss of $100,000,000 in gold.

Scarlet fever without eruption, small-pox recognizable as such with difficulty, "choleroid," and very mild cases of bubonic plague and yellow fever, all have repeatedly given rise to malignant epidemics, and yet the need still exists of repeated reminders that not every case of diphtheria or typhoid fever presents all the symptoms enumerated by medical teachers.

The advantage of an abundance of fresh air in febrile diseases was again exemplified in our last war, both in the West Indies and at home. One of the surgeons of the Seventh Army Corps, writing about the prevalence of typhoid fever, says: "The mortality was not extreme, for tents make the best possible typhoid hospital. It was surprising to those of us on the hospital staff who had had extensive hospital experience in the larger cities to see how well desperate cases of this fever progressed in the open tents despite the wind and rain and necessary crowding, and, for a long time, a very limited supply of medicines and hospital facilities. The wooden pavilions later built for division hospitals are certainly going to prove a failure as compared with tents for the treatment of typhoid fever."—*Philadelphia Medical Journal.*

The Massachusetts State Hospital for Consumptives, opened to patients October 1, is situated in Rutland, about 1,200 feet above sea-level. The charge for patients will be uniformly 50 cents a day.

Some of the barbers and physicians of Illinois are preparing a legislative bill providing against the danger of the spread of disease in barber shops. The idea is to have nothing but cleanly and antiseptic public barbering in that State.
A paper lately read before the Philadelphia Co. Medical Society reports five cases of diphtheria in one family, in all of which the typical symptoms of diphtheria were present and inoculation from the affected throats revealed the presence of the diphtheria bacillus, but there was a complete absence of false membrane. The cases rapidly recovered under the influence of antitoxin.

The Inspectors of the Local Government Board of England who held an inquiry into the cause of the very serious epidemic of typhoid fever of last year report that the pollution of the public water supply was the prime cause.

The Diphtheria Antitoxin Patent.

After five unsuccessful applications, Behring, of Germany, has succeeded in getting a United States patent on diphtheria antitoxin. How the former objections of the Department against allowing the patent were removed does not appear. The sentiment of medical journalism, not only in the United States, but in England, France, and his own country, is generally strongly condemnatory of Behring for attempting to monopolize the production of diphtheria antitoxin in this country for his personal gain. His assurance that the American people will now, under his supervision, be provided with a cheaper and more trustworthy article than hitherto deserves nothing but contempt. Though the investigations of Pasteur, Roux, Kitasato, and Behring gave diphtheria antitoxin to the world, it is now like "carrying coals to Newcastle" to look to Europe for our supplies of diphtheria antitoxin. Our American laboratories have lately been producing antitoxin of greater potency than Behring's; and after a personal examination of their methods and products through its special committee, this Board reported a year ago or so that American antitoxin is now preferable for use in this country. Behring's act deserves to be met with a universal boycott of his antitoxin in this country.

Climatic Conditions of the Maine Coast.

In the discussion which followed the reading of a paper by Dr. F. I. Knight of Boston before the fourteenth annual meeting of the American Climatological Association in Washington,
D. C., Dr. Bowditch of Boston said: Another peculiar characteristic of the Maine coast is the often dry character of the fogs. It may at first seem a misnomer to speak of a "dry fog," but any one who has been in that region will understand what I mean. The light vapory mist which drives in frequently from the sea has no definite sense of moisture as it strikes the face, and in the midst of it the air frequently feels dry. Often I have seen clothes hanging out and drying during such fogs. They are in marked contrast to the drenching fogs of the "south shore."

Again, on the coast of Maine, the southwest wind, which in Boston has a debilitating, blustering, muggy quality, is delicious in its cool, bracing, and even dry quality, as it comes over the colder waters of that shore. This is especially noticeable on the islands along the coast, and the climate generally has more of the typical equability of island climates. The snows in winter are not so deep and do not last so long as on the mainland. In the vicinity of Mount Desert, the presence of the mountains there has, doubtless, an effect upon the quality of the atmosphere, and would partly account for what is often spoken of—the effect of sea and mountain air combined. Its peculiar dryness, even though on the coast, has been often so marked that I have frequently thought that certain phthisical patients, who need a dry, bracing atmosphere, might improve there, although I have never quite dared to recommend it for such cases.

Dr. Babcock, of Chicago: What I was especially struck with in the paper just read was some of the statements concerning the tonic and bracing climate of Maine. There is no doubt of this, yet, in thinking upon it, I recall some statistics given to us by one of my professors when I was a student. He had found tuberculosis most prevalent in Maine and adjoining states, and that it diminished as one came southward along the Atlantic coast and southwest; and I wondered why tuberculosis should be so prevalent in Maine if the climate of that State was so tonic and bracing. I concluded that it must be due to the long winters and comparatively short summers, and the consequent inability of the inhabitants to spend much time in the open air; this brought me to the reflection that, if we are to send tuberculous patients away for the summer, or patients who have an hereditary tendency to tuberculosis, we, of course, should
send them to climates that are stimulating and bracing, and where they can remain for a great part of the time in the open air, otherwise no benefit will be derived. I think that this simply emphasizes the truth of the principle that it is life in the open air that cures our tubercular patients, and that, however fine the climate, the consumptive will not recover unless he spends his time out of doors.

Dr. Bowditch: When I spoke of the climate of Maine I was speaking of its climate in summer. The tubercular disease among the women of that State may be accounted for largely, I think, by their habit of huddling about air-tight stoves in the long winters, and never going out. As a matter of fact, the existence of tuberculosis is very rare among the inhabitants of the islands. Most of the men lead hard fishermen's lives, exposed to the severest kinds of weather; but tuberculosis, according to my observations, is rare there.

Dr. Taylor: I, myself, am a Maine man in summer. I have looked up the subject very carefully and found that, as a matter of fact, tuberculosis was very prevalent some years ago, and a great many people thereaway died of it. But that is now a matter of past history. It is no longer so prevalent or deadly. I think that its prevalence was, in part at least, due to the insufficiency of the food in quantity, quality, and preparation. Since that time these conditions have astonishingly improved. In my hunting trips I have seen quite a good deal of this sort of thing, but it is now disappearing. Its former prevalence, as Dr. Babcock has said, was due to the inability of a certain class to spend much time in the open air, especially in bitterly cold winters. The question of a choice of a summer residence is an interesting one. The atmosphere along the coast is not dry, only relatively so. The coast line of Maine is enormous. If all the indentations were straightened out into one line, that line would be 6,000 miles long. It is true that we have what are called dry fogs, during which we can scarcely notice any dampness, although they obscure the view, the moisture of fogs varies exceedingly.

I have been studying the effect of an ideal form of climate where we can get an inland lake, near but somewhat removed from the sea, because the climate is likely to be a dry one. The air is less subject to sudden chills, and yet it has sea elements.
I have among my patients a good many neurasthenics and also a good many persons who are suffering from rheumatism or its effects; and I considered the most perfect climate for them is to be found in some such places as those which I have seen where they can get the peculiar combination of sea and mountain air on a lake surrounded by conifers.

Dr. Knight: The coast of New England is not to be recommended except in summer and early autumn. Regarding the prevalence of consumption, it does not exist until introduced. No climate could be more favorable for the spread of pulmonary tuberculosis than that of Iceland. They have none now, but if it once got a foothold there it would make fearful ravages. Tuberculosis is diminishing among the native population in New England, as in old England. The mortality rate is kept up in New England by the ingress of people of other nationalities.—Tr. Amer. Climatal. Assoc.

The Farmer and the Pure Milk Question.

The farmer should recognize the fact, which is patent to all others, that to arm the health authorities of the city to which he sends his milk and beef with authority to satisfy themselves that the herd which produces this milk is free from disease, and that the milk itself in the process of production and delivery is free from liability to dangerous contamination, is to accomplish more for the permanent and increasing prosperity of dairy farming than is possible in any other way. He must know that the market is crammed to fullness with every description imaginable of artificial foods for infants and invalids, some of which have proven themselves to be fair substitutes for cow's milk, even when the latter is good and pure. When the latter is poor, however, or has been carelessly handled, most experienced physicians and many intelligent laymen know that a good artificial substitute is far preferable. Then, again, is the ever constant anxiety that the milk may be infected. Once remove permanently these well-grounded objections to a milk supply, and the demand must considerably and permanently increase.

Therefore, we say to the farmer and his friends: You have a strong motive to join with the health authorities in their attempts to secure legislation to protect the milk supply from infection, adulteration and other impurities whether in its production or in its distribution and sale; you thereby are sure to protect and permanently improve your own personal interests, and at the same time deserve the name of public benefactors.—Diet. and Hyg. Gazette.
Facts About Bovine Tuberculosis.

When tuberculosis gets into a herd, the only way to stop it is to remove every diseased animal as indicated by the tuberculin test. While sanitary conditions have much to do with the spread of the disease, it cannot be got rid of by sanitation. The disease is found in some of the best built barns, and it is not found in some of the poorest and most insanitary. Bad sanitary conditions cannot originate the disease. In all the 900 diseased cattle which have been found in Vermont, the disease has been traced, in every case, to direct contagion.

The disease does not stand still; get it into an animal, and it usually develops. Put a diseased animal in with a herd of well ones, and it will gradually spread, sometimes slowly, sometimes rapidly. In a year many animals may be involved. A neighbor bought a heifer from a herd that has since been found diseased. In about a year, five of his cows were infected. So one animal may spread the contagion: The worst possible policy in dealing with it is the let-alone policy. You might just as well expect to clear your farm of wild mustard or orange hawkweed, or Russian thistle by letting them alone. It is the nature of tuberculosis to spread.

As to physical examinations, they are of no use whatever. In one herd, seven per cent of the animals were killed annually for 15 years upon physical examination, but when tested with tuberculin, 75 per cent were found diseased. Those who claim that tuberculin injures cattle are simply ignorant of the facts. Not a single case has been reported in this State, where tuberculin has injured any animal. My cows showed no more ill effects from the test than they would from the prick of a needle. Heavy injections have done no harm. Cows have been heavily dosed to see whether they would be injured, and no ill effects whatever have appeared. After a herd has been cleaned out, there must be the most thorough disinfection of the stables. The germs live only 229 days. It is no small matter properly to disinfect a stable, but it is invariably insisted upon here in Vermont.—J. W. Newton in The Rural New Yorker.

Hygiene in Plague.

Dr. Beveridge, late member of the Poona Plague Committee, writing on this subject says:

"Of all precautionary measures, that of the first importance is cleanliness. Plague is essentially a filth-borne disease. Where epidemics have occurred lately, the European community has suffered in far less proportion, doubtless from their cleaner habits and more sanitary surroundings. It is not sufficient to put the house in order on the appearance of the plague, but to have it so long before it arrives.

"All histories of plague point to the presence of insanitary
conditions; the worse these conditions the more firmly the disease takes hold. In Sai-Ping-Shan, in Hong Kong, whole families of human beings together with dogs, pigs, and fowls herd together in closely confined rooms with little or no light or ventilation. The floors lay inches deep in filth, akin to the rush-strewn floors described in the history of the plagues of England, where substrata of fermenting organic matter lay long undisturbed, the refuse of ages, forming a suitable resting-place and cultivating-ground for the plague bacillus in all its requirements. From such houses filth was removed by the soldiers of the Shropshire Light Infantry employed in cleaning them. So bad was the stench that many were driven to seek refuge in the open air, vomiting as they went.

"Among those exposed to infection the importance of personal cleanliness need only be alluded to. The clothes should be frequently changed and exposed after wear to the sun’s rays or to moist heat.

"It is now well known that plague is frequently the result of inoculation, and can gain entrance to the body through abrasions of the surface, either mucous or cutaneous. It has been thought that a possible cause of infection among natives is by the habit of going barefoot, whereas the European being well booted is less susceptible, but there are many other factors to adduce for this lessened susceptibility. Those suffering from abrasions, wounds, and ulcers should avoid proximity to the disease.

"From March to May, 1897, over 900 soldiers were employed in Poona combating the plague, and the most careful precautions were considered necessary to protect them. Before starting work in the morning each man had a good meat meal. No man was allowed to go out who had any cuts or abrasions, and all cases of slight ailments were detained in camp. Immediate dis-infection by antiseptic solutions carried with them of all cuts and bruises contracted during their work was resorted to. On return to camp their clothes were exposed to the sun’s rays for the rest of the day. As a result it is gratifying to record that there were no cases of plague among them.”—The Journal of State Medicine.

Hygiene is for Whom?

"Happy little Mary Wood
Always did the best she could."

But big Mary Wood did not. She would not. She wore corsets warranted to make her an inch smaller than any other corset in the world. She crowded her shapely number 7 feet into number 5, high-heeled shoes, and went crippling around with rings on her fingers and corns on her toes all the rest of her fashionable life. Hygiene is of no good for the army of this kind of Marys; nor for the men who not only know that their vicious habits will bring rottenness into their own flesh and
bones—a personal matter of no great consequence to the world—but also that their sins will be visited upon their innocent offspring to the third and fourth generations. Hygiene is for those who are inclined to do right and avoid the wrong, and who sin through ignorance.—Dr. Didama in Philadelphia Medical Journal.

Rules in Electric Accidents.

1. Break the circuit at once if there be an interrupter close at hand and you know how to use it. If not, lose no time, but proceed to Rule 2. 2. Do not touch the man’s body with your bare hands, but if India rubber gloves are not at hand pull him off the cable by his coat tail, or fold your coat or some dry article into two or three thicknesses, and, using this as a pad to take hold of the body, pull it away from the circuit and resort to Rule 3. 3. If unable to get him off, raise with covered hand that part of the body which is touching the earth, or one of the poles of the circuit. This will break the circuit, and it will usually be thus possible to get him easily away, and, if so, proceed to Rule 4. 4. If still unsuccessful, make another pad, and, placing it between the ground and that part of the body in contact with the ground, continue your efforts to detach him. 5. Having pulled him away from the cable, free his neck from clothing, and treat the case as one of drowning, one method being as follows: 6. Open his mouth, and, taking hold of the front part of the tongue with your fingers (covered with a handkerchief if you have one), draw the tongue forwards, and gradually let it go back 16 times a minute. Be sure that the root of the tongue is acted upon and drawn forward. If the teeth are clenched and you cannot get them apart with your fingers, gently separate them with the handle of a pocket knife or by a small piece of wood, cork, etc. 7. Resist the efforts of the bystanders to pour stimulants down his throat.—The Lancet.

Paper Floors.

Paper floors are enjoying a steadily increasing popularity, which is readily explained by the many advantages they possess over wooden flooring. An important advantage consists in the absence of joints, whereby accumulations of dust, vermin, and fungi, dangerous to health, are done away with. The new paper floors are bad conductors of heat and sound, and, in spite of their hardness, have a linoleum-like, soft feel to the foot. The costs are considerably lower than those of floors made of hard wood. The paper mass receives a small addition of cement as a binder, and is shipped in bags, in powder form. The mass is stirred into a stiff paste, spread out on the floor, pressed down by rollers, and painted with oakwood, nutwood, or mahogany color after drying.—Health.