"Pain," says Delboeuf,¹⁴ "leads the patient to think of his lesion and in thinking of it he exasperates it. Hypnotism (suggestion) by distracting this attention works against the suffering. It diminishes the evil by leading the patient not to think of it."

"Suggestion," remarks Bernheim,¹⁵ "attacks the malady through one of its elements and the suppression of this morbid element may react happily upon the entire pathological condition, of which all the elements are reciprocally subordinated the one to the other. What else is effected by habitual therapeutics? Do opium, quinine, salicylic acid, frictions, vesication, massage, or electricity, effect anything else than an attack upon the malady by one of its elements? Do we possess many medications which have the property of modifying directly the material lesion? It is the restoration of function, which, when it is possible brings about organic restoration."

"Hypnotism," says Beaunis,¹⁶ "is nothing else than a combination of nervous phenomena which ought to be studied like any other physiological question — cerebral localizations, for example, — and with the same scientific spirit."

It is useless to multiply argument. In personal experience the sceptical will find abundant proof of the value of hypnotic suggestion.

In one who is unfamiliar with hypnotism, surprise is usually created by the discovery that the process is of frequent and striking value in forming a diagnosis. As an illustration I may quote one of my own cases: The patient is a young woman, the details of whose case I will give later. Suffice it to say that she was supposed to have paraplegia. Her legs were incapable of giving her the slightest support. Her feet were moved and placed for her. I hypnotized her as she sat in a wheeled-chair. She passed at once into the seventh degree of sleep. Lifting her foot until the leg was in a horizontal position, I said: "You cannot put your foot down. Try as hard as you like." The limb remained for a time rigidly fixed in extension. What further than this cataleptic attitude was needed to prove that the paralysis was functional? Observe, too, that only a few moments were needed to reach a diagnosis.

(To be continued.)

ANTISEPTIC MEDICATION.

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WE may classify the diseased conditions in which medicine finds aid in the use of antiseptics under three heads: first, diseases affecting tissues that lie on the surface of the body, chiefly, the skin; second, diseases of the air passages and lungs; third, diseases that are caused by, or bear a close relation to, bacteria, and unusual or excessive fermentative changes in the alimentary canal.

With antiseptic agents applicable in the first class of diseases we are fairly well equipped. Almost all antiseptic drugs can be safely applied to the surface of the skin, and a large number of them have a well-proven and universally recognized value in the treatment of parasitic diseases of that tissue. Without them, the dermatologist would be deprived of a most essential

part of his armamentarium. Sulphur, the hyposulphites, chrysophanic acid, several mercurial preparations, boric acid, resorcin and naphthol are among his most effective and frequently used weapons.

It may be objected that they are useful rather as parasitocides than as germicides; yet, some of them are so effective in diseases of the skin, not parasitic, as, at least, to give coloring to the view that these diseases depend on the presence of yet undiscovered germs in the diseased tissue.

I am not aware that any drugs of the antiseptic class, promising to be more useful than their predecessors in the treatment of diseases of the integument have recently been added to our list, — a list too familiar to all, to call for farther statement.

Before leaving this part of the subject, however, let me refer to a few practical points that call for a more general recognition than they have received.

A boric acid ointment, made up of a saturated solution of boric acid in hot glycerine one part, to four or six of cosmoline, is a most servicable agent in the acute and subacute stages of eczema. In the more chronic stages, the same ointment forms an admirable base to which to add ol. ruscum, zinc oxide, and prepared calamine, making by far the most generally servicable local treatment for eczema that has come under my observation. That there are cases that it will not cure when errors of diet, etc., have received proper attention, is doubtless true, but I have yet to meet such a case. The first combination has the advantage of being odorless, and, when applied, practically colorless, and may be depended on in many cases in the early stage; the second finds its chief utility in the subacute and chronic stages.

The large proportion of cases in which chronic otorrhœa, even of five or ten years standing, may be cured by packing the ear with boric acid has been for several years known to the profession, and yet the expedient is not as often employed as it might be with advantage. My own experience leads me to believe that the best result can be had in most cases only by the use of a powder much coarser than the impalpable powder now generally dispensed by apothecaries.

The recent testimony to the almost specific effect of campho-phenique as a local application in erysipelas, even of the severest type, cannot but interest us, though we may perhaps wait its longer trial before admitting all the claims of its enthusiastic friends.

The second class of diseases to which antiseptic remedies are perhaps applicable, includes several diseases of the air passages and lungs. Here we find ourselves limited to a small number of antiseptic agents, and confronted with many difficulties in devising methods of administering the drugs and in judging of the results. Pulmonary antiseptics has as yet won to its support comparatively few strong names in the profession, and yet we can hardly deny that the field is, at least, an interesting one, and not without its large promise, nor can we afford not to avail ourselves of some of the results already gained. Three methods have been proposed and practised for bringing antiseptic remedies to bear upon the air passages and tissues of the lungs. (1) By charging the inspired air with the remedies in the form of either spray, vapor or gas. (2) By administering remedies by the stomach which it is hoped will be eliminated through the lungs in antiseptic form. (3) By intra-pulmonary injection of antiseptic fluids. Our efforts to effect the first, have

¹⁴ De l'origine des effets curatifs de l'Hypnotisme.

¹⁵ De la Suggestion, etc.

¹⁶ Du Somnambulisme Provoqué.

been greatly facilitated, so far as the administration of such remedies as must be used in the form of spray is concerned, by the recent improvement in atomizers for the purpose. The fine, smoke-like vapor given by those that projecting the spray against a hard resisting surface will doubtless be carried much farther into the bronchi than the relatively coarse spray given by the earlier instruments, which probably rarely passes farther than the trachea. Improbable as it yet seems that vapor so produced reaches the bronchioles and air-cells of the lungs, it is reasonable to believe that it may reach the smaller bronchi, and as far as that, diminish, if not destroy, bacterial growth in the secretions, and perhaps in the mucous membranes, so rendering us valuable aid in retarding, if not arresting, the progress of disease.

May it not be true that when volatile antiseptics are used by this method, and carried thus far (to the smaller bronchi) in the form of a spray, they are then in part volatilized by the heat of the lung and in this more diffusible form carried into the bronchioles and air-cells? Certainly some of the results gained would seem to be best explained by such a theory.

Probably the method of most promise for charging the inspired air with an antiseptic to be carried to the air-cells is that of using a volatile antiseptic, volatilized before it is inspired, or a gas, like ozone or sulphurous acid, which will be aided in its progress by the law of the diffusion of gases.

That substances so volatilized or in gaseous form, do penetrate to the air-cells and enter the blood we must now accept without question, but that they collect in the air-cells in quantity sufficient to be actively germicidal seems questionable, and until better proof than the present is offered, it must be considered not proven.

The most that we can, at present, expect to gain by this first method is, not an aseptic condition of the lung, but such diminution of bacterial development as will be an important aid in controlling the progress of disease, or, if used in connection with other means, in curing it. Since it is probable that the germs of some contagious diseases lodge first in the air-passages and find there the soil for their first increase, it is very possible that these methods may be useful as prophylactic measures.

Of the antiseptics available for use in the form of spray that which has the best standing is creolin one-half to two per cent. solution. Listerine deserves a prominent place here. Miguel and Rueff's one-tenth per cent. solution of hydrarg. biniodide has hardly had sufficient trial as yet to determine its place, though the results gained by its advocates certainly entitle it to consideration.

For use by volatilization, creosote, iodine, eucalyptus, carbolic acid, and beta-naphthol must be given a place in the first rank. For gaseous inhalation, sulphurous acid has a strong claim upon us since the remarkable results gained by Dujardin-Beaumetz and Dariex in the treatment of the first and second stages of phthisis. Its value in whooping-cough seems also to be well-established. The results reported by careful observers from the use of ozone inhalations also call for mention.

Admitting the good results gained from the use of these remedies, it may still be questioned whether those results are chiefly, or perhaps at all, due to an antiseptic effect. No investigations have yet gone far enough to determine this with certainty. If, however,

we can get the result of relief or cure, we shall not do wisely to reject the remedy, because we cannot assert positively the method of its action. It is in phthisis and chronic bronchitis that these measures will prove most useful.

A limited experience has led me to question the advantage of attempting treatment of disease below the pharynx by a direct spray that carries an appreciable current of cool air upon the larynx or into the trachea. For this purpose, the steam-atomizer or the indirect spray, or the volatile or gaseous agents are, I think, to be preferred.

The second method of attempting to gain an antiseptic effect in the respiratory passages, is by the use of antiseptic agents introduced into the general circulation. That much benefit is often had in cases of phthisis and chronic bronchitis from the internal use of agents that are strongly antiseptic, we cannot question, but until farther proof is offered we must be allowed the largest liberty of doubt as to whether their effect is not more that of an alterative than an antiseptic. Of these agents, creosote in three drop doses, *t. i. d.*, probably deserves the first place. Hopman's results in a series of several hundred cases ought to call our attention to it anew.

Luton's claim for the phosphate of copper as almost a specific in the early stages, is attended by a statement of results that merits consideration. Hydriodic acid perhaps deserves mention.

The third method—that of intrapulmonary injection of antiseptic fluids, is probably more useful than it is likely to become popular with the profession. A method that however useful in the majority of cases, is likely, in rare instances, to give rise to so startling and serious a symptom as hæmoptysis, will need to establish its claim well, before it will come into general use. Whether we are justified in putting our reputation before our patient's interests so far as to reject the method, in cases best adapted to its use, after the considerable evidence of its utility already had, is, I think, doubtful. Creosote, carbolic acid, and iodine, alone or in combination, seem to be the agents best adapted to this method.

Before closing our discussion of antiseptic medication of the air passages some reference should be made to diphtheria, as it has its local manifestation here.

In no disease is the value of antiseptic treatment better recognized. The recent literature relating to the subject, is much too voluminous to attempt a review of it, and I shall, instead, content myself with presenting a treatment which has given me the greatest satisfaction, and which I cannot but commend to others. I make no claim of originality for it, as it makes use of no agents not previously employed by others. What little may be new in it is rather in slight details of method of using the agents, than in the agents themselves.

For internal use, two mixtures are employed; one, the time-honored iron and chlorate of potash mixture; the other, two to five drops of spirits of turpentine and as many grains of sulpho-carbolate of soda put up with cinnamon water and acacia, the exact amount of each constituent of the mixture being determined by age and condition of stomach. For example, for a child twelve years old, and with ordinary ability to retain medicine on the stomach they would stand about as follows:

R Tr. ferri chloridi 3 iss-3 ii
 Potas. chlorat. 3 iss
 Glycerine 3 ii-3 iii
 Aq. cald. ad. 3 iv M.
 Sig. One teaspoonful every one to one and a half hours.

R Sod. sulpho-carbolate (Monson's) 3 i 2 ii
 Spts. terebinth gt. o
 Pulv. aenclm 3 iii
 Aq. cinnamon ad. 3 iv M.
 Sig. One teaspoonful, in water, every one to one and a half hours, alternating with iron mixture.

These are doubtless most effective when they can be taken without dilution, but patients will often need to dilute them moderately.

The larger doses of spirits of turpentine advised by its earlier advocates (doses of from one drachm to one-half ounce) I have rarely found patients willing to take or able to retain. Since becoming convinced of the greater utility of smaller and frequently repeated doses, I have had no difficulty in its use.

All admit the necessity of local treatment. The things most desirable in an agent for topical use, are, first, that it should be a sufficiently active germicide; second, that it should have, if possible, some solvent power over the false membrane; third, that it should be gently astringent and soothing to the unaffected mucous membrane, so fortifying it against attack, rather than irritating and, therefore, tending to invite the extension of the disease to new points; fourth, that it should be easy of application, so avoiding any nervous strain upon the patient, a point of special importance in the case of timid and wilful children; and fifth, that it should be capable of continuous application for a considerable period. These requirements are, I think, met by a mixture of lime water, listerine and carbolic acid. Listerine is in the proportion of one-sixth to one-tenth and carbolic acid (always Calvert's No. 1), about one per cent. This is used in a Codman and Shurtleff steam-atomizer, the patient breathing in the spray through his open mouth, for one half hour out of every two hours.

The lime water acts perhaps as a slow solvent of the membrane; at least, aids in its disintegration; the listerine is a mild astringent and a very effective antiseptic, and is peculiarly useful in keeping the unaffected mucous membrane in such healthful condition as to render unlikely any extension of the false membrane; it is pleasant in its application, the most timid child soon welcoming the time of its use, and frequently falling asleep under its soothing influence; and finally, a matter of great importance, it can be safely used for one-fourth of the time, and even longer if the carbolic acid is reduced or omitted.

One may easily convince himself of the thoroughness with which it reaches every part of the mouth and pharynx. It can easily be adjusted so that the patient may use it in an entirely natural and comfortable recumbent position in bed. Except in the mildest cases, there is added to the spray, the fumes of spirits of turpentine, produced by adding half an ounce of the spirits to a quart of water kept just below the boiling point in a croup kettle. By bringing the nozzle of the croup kettle close to the mouth-piece of the steam atomizer, the turpentine fumes are mingled with the spray, and carried on into the mouth by the force of the spray current. In severe cases, the spirits of turpentine is, in addition, evaporated from water kept constantly boiling in the room.

In those cases in which the nares are affected, but not closed, by the exudation, a nasal tip is occasionally

exchanged for the mouth-piece of the atomizer for inhalation through the nostrils. If the nares are closed by the false membrane, gelatine nasal bougies medicated with iodoform, are passed through, and allowed to melt there. I have been best pleased with those manufactured by Mitchell & Co., Philadelphia. If the false membrane is impacted too densely in the nares to allow of the introduction of these gelatine bougies, the "vector cuprinus cum suppositorio" made by Foote and Swift of Philadelphia, are used, and left in position till the "suppository with which they are charged, has melted. I have used with most satisfaction either iodoform, or iodoform and resorcin combined, as the disinfectants to be carried in by these bougies or vectors.

The importance of opening a way through the impacted nares sufficient for the effective introduction of disinfectants in order to give the patient the best chance of recovery, is generally recognized.

There is no difficulty in the manipulation if it be gently and intelligently done, and it doubtless contributes greatly to recovery in many desperate cases.

This treatment, supplemented with attention to proper nourishment and stimulation when needed, has been most satisfactory in my hands, bringing through many cases that seemed well-nigh hopeless, cases in which the entire pharynx has been involved, and the false membrane has appeared at the nostrils and occluded the nares with so dense a mass that a passage could be made through it only by some instrument rigid as the "vector cuprinus." Peroxide of hydrogen, which, judging from the experience of others, is a valuable agent, I have not tried, because so well pleased with the method already described. Frölich's method of using turpentine by tablets of sugar containing one and one-half to three drops which are allowed to melt in the mouth, seems well worth a trial.

The third direction in which we may make useful application of antiseptic agents, is in diseases that are caused by, or bear a close relation to, bacteria, and unusual or excessive fermentative changes in the alimentary canal. No question has engaged a larger share of the attention of the thoughtful minds in the profession during the last few years, than this—the possibility of securing intestinal antiseptics. While yet far from reaching positive conclusions, and unable to estimate certainly the exact value of much that has fallen under our observation, we have, nevertheless, learned much that is useful, and that points us with large promise along the way of our future study.

It is worth while to have gained a better knowledge of the difficulties of the problem we have to solve—that we must combat not bacteria alone, but also their worse product, the ptomaines. As a result, the task may seem more difficult, but we can approach it more intelligently. We have gained too, a better acquaintance with the severe tests by which all supposed results must be proved, and as a consequence, a larger number of medical men are being trained in the manipulations essential to the carrying out of these tests. Many of our earlier conclusions may fall to the ground, but better will surely rise in their places. Then, too, the requirements of a good antiseptic for intestinal use are coming more clearly into view. It would be hard to say which is the fact of most significance as indicating the future of intestinal antiseptics

—that so many prominent names in the profession are lending their approval to it, or that so large a proportion of the most important additions, during the last five years, to our list of drugs useful in diseases of the alimentary tract, must take their place in the antiseptic class.

The drugs that are the latest comers upon the field for our present purpose, are creolin, naphthalin, beta-naphthol, salicylate of bismuth, and salicylate of magnesia.

Creolin has its most prominent and successful advocates in Hiller and Spaeth. Hiller declares it to be the ideal antiseptic for the stomach and bowel; he strongly urges its use in typhoid fever, and makes the extraordinary statement that in doses of "three to five grains, *t. i. d.*, taken in strong gelatine capsules, it will promptly relieve meteorism from whatever cause, by its arrest of fermentative change"—a fact of great value to us if proved to be true, since many serious diseases as typhoid fever and peritonitis often have their danger much increased by obstinate tympanitis. Spaeth finds the same proof of its power to limit putrefactive processes in the intestine in the decrease of intestinal gas, and the inodorous character of the fæces after its use. Others have noted the value of enemata of one-half per cent. solution in dysentery—sixteen cases treated by this method all recovering, during an epidemic in which a considerable proportion of these treated by other methods, died.

Beta-naphthol has won to its support such prominent names as Dujardin-Beaumetz, Bouchard, Delafield and Shoemaker, not to mention many others whose opinions are entitled to much weight, as Comby, Bruce and Aulde.

Dujardin-Beaumetz and Delafield use it in combination with salicylate of bismuth in conditions depending on undue fermentative or putrefactive changes in the stomach and intestine, the latter commending highly the combination of the two antiseptics in the diarrhœa of typhoid fever.

Shoemaker states that he believes it to be "one of the best and most valuable non-poisonous antiseptic agents at our disposal," both for external and internal use. Bouchard declares "that intestinal antiseptics in general, and antiseptics by naphthol in particular should be practised in all those morbid states which appear to depend on abnormal putrefaction which occurs in the digestive canal."

To this statement he adds the following: If intestinal putrefaction plays so important a part in pathology it is necessary to diminish its intensity. For this purpose an insoluble antiseptic is preferable, so as to make its passage through the entire length of the bowel. Naphthol best fulfils these indications. He employs it specially in typhoid fever, finding as a result, the stools completely deodorized, tympanitis and delirium rare, and the tongue moist.

Bruce declares very positively for its use in typhoid fever, securing by it a safe and tolerably efficient production of intestinal antiseptics, a consequent shortening of the disease, with complications less frequent, and convalescence more rapid.

Aulde confirms these conclusions by many observations of its use in typhoid fever, diarrhœa and dysentery. His method of using it in tablet triturates which have not been compressed, seems to be a valuable one.

Schwald's experiments with naphthalin—a notable illustration of the painstaking and scientific methods

that must be largely followed before we can reach positive conclusions—go far to sustain its claim upon our attention. He found that in safe doses it reduced the total of bacteria of all kinds in the fæces to one-third or one-fourth of the number present if it were not used; that it had a specially strong effect on typhoid bacteria, an effect probably greater in the bowel, where the warmth of the body tends to volatilize it, and the peristaltic movements to mix it thoroughly with the fæces, than in the test-tube.

The salicylate of bismuth and of magnesia, the iodide of starch, sulphurous acid and bisulphide of carbon, all have their enthusiastic advocates, though the evidence as yet produced in their favor seems to be less positive than in the case of creolin and beta-naphthol.

During the last year I have seen comparatively few cases of typhoid fever, and in the treatment of these, have been well content with my former method, varying it only by the substitution of sulphurous acid and sulpho-carbolic acid of soda for the salicylate of soda in cases where the condition of the kidneys precluded the use of the salicylate. In the future I shall be much disposed to give creolin and beta-naphthol a trial, as being probably the most promising of the new agents.

Shoemaker's observation that beta-naphthol whitens the stools and loosens the bowels in some instances suggests that its effect upon the secretion of bile needs further study.

The great advance in the treatment of yellow fever had by the adoption of Sternberg's suggestion of the use of corrosive sublimate and bicarbonate of soda, is perhaps significant of the value of antiseptic agents in the bowel, though its author characterizes it as an alkaline rather than as an antiseptic method.

It is interesting to note the many testimonies from prominent physicians of the value of antiseptic enemata.

Backhaus, finding in the extraordinary success of Cantani in treating cholera with enemata of tannic acid solution, a suggestion for its use in typhoid fever, reports that while not cutting short the disease, the diarrhœa and severer symptoms are limited, and he announces his belief that the expedient checks the increase of bacteria, and renders harmless the ptomaines produced by them.

We may well believe that mildly astringent and antiseptic enemata in diarrhœa, dysentery and typhoid fever have come to stay as a well-recognized and most valuable expedient.

A fourth reasonable aim of antiseptic medication will be claimed by some; namely, the introduction into the blood of an antiseptic that will render it, and the tissues that it flushes sterile of bacterial life. That some of the results gained by the use of antiseptics in the treatment of diseases that have been believed to depend on germs developed chiefly in the tissues, would seem to suggest such a conclusion, is true. I do not know how we shall explain the effect of inhalation of the fumes of turpentine and sulphurous acid gas in some diseases unless we accept the view that their influence is exerted in large part after absorption. We may, however, question whether the result is had by destruction of the germs, or of the resulting ptomaines.

The recent discovery of the germicidal power of healthy blood serum over most disease germs suggests

that the direction of our effort, so far as antiseptics within the tissues is concerned, should be in maintaining the active condition of the serum, rather than putting a germicide into it.

May it not be that turpentine and sulphurous acid gas exert whatever power they have, not as being themselves germicides, but by supplying some needed conditions for the activity of the serum?

The startling discovery that the blood serum into which we have been making toilsome effort to introduce some efficient antiseptic for its protection, is itself in health an antiseptic of extraordinary power as against many disease germs, changes somewhat the problem of antiseptic medication.

We see now that there are diseases consequent to the increase of certain forms of germ development *outside* the tissues in the alimentary, and possibly the respiratory tracts; diseases that result from the absorption of ptomaines produced by these bacteria. That the blood serum has the power of destroying these bacteria in case they gain entrance to the tissues, is a fact of little significance, so long as it can neither touch them in their place of most rapid growth, that is, outside the tissues, nor destroy or render inert the ptomaines that they throw into the circulation.

So far as this class of diseases is concerned the problem remains essentially unchanged for us; namely, to destroy the bacteria outside the tissues, in the intestinal contents or the bronchial secretions, and to destroy or render inert the ptomaines either before or after absorption.

Our study has concerned itself almost wholly with the destruction of the bacteria; a wise endeavor, and yet too narrow a one. It has concerned itself as yet little — although it ought to much — with agents that will destroy the ptomaines, or render them inert, or provide efficient antidotes for them. Facts that are interestingly suggestive in this direction are, first, that inoculations with the ptomaines causative of certain diseases will protect against their attack, and second, the statement of Vaughan and Novy, that "a certain quantity of oxygen is necessary to the production of poisonous bases; while on the other hand a free supply of oxygen invariably yields non-toxic ptomaines. We cannot cut off the supply of oxygen; but can we perhaps supply it so freely in the bowel as to obtain the non-toxic in place of the toxic ptomaines?"

Again the chemically unstable character of many of the ptomaines, and the consequent difficulty of isolating them would seem to give good promise of finding means for rendering them inert within the body.

Vaughan and Novy, in their treatise on "Ptomaines and Leucomaines," refer to "the peculiar difficulties with which the chemist has to contend in his endeavors to isolate the basic products of putrefaction. . . . The substances which he seeks are often prone to undergo decomposition, and in this way escape detection. . . . The investigator has frequently been disappointed when on the evaporation of a solution which he has demonstrated to be poisonous he finds that the residue is wholly inert. Again, he may destroy the ptomaines by the action of reagents which he uses. So simple a procedure as the removal of a metallic base from a solution containing a ptomaine by precipitation with hydrogen sulphide gas has been known to destroy wholly the ptomaine."

It is not unlikely that chemical compounds which need to be so carefully guarded against decomposition

in the test-tube, may be found to be very open to attack within the body. This is a problem in which we must enlist the aid of the expert chemist. We may possibly yet find that we shall do best to leave bacteria alone, and combat their products.

A second class of diseases is made up of those in which the germs develop chiefly within the blood or tissues, and over the germs of which, a healthful blood serum has a destructive power. So far as these diseases are concerned, the problem before us is greatly changed by our knowledge of the germicidal power of healthful blood serum.

As respects these diseases an entirely new question presents itself, and doubtless a most difficult one to solve, lying as it does close to the secrets of the vital processes; namely, what are the peculiar conditions on which the power of the blood serum depends, and how may we maintain them intact? Our effort must henceforth address itself to this problem rather than to that of the introduction of antiseptics as such into the blood.

Doubtless there are diseases that share the characteristics of both these classes, the first type predominating in the early stages of the disease; the second in the later stages. Here the problem will be more complex still.

In the few diseases in which the germs to which they may be traced find their place of increase in the blood or tissues, and whose germs are not subject to the germicidal power of the blood serum, the problem of introducing an antiseptic into the blood may still press for solution.

The light breaks upon our way dimly yet significantly; not enough to indicate the final result, but quite enough to show us the beginning of the way along which we must press toward that result.

THE FREQUENCY WITH WHICH ARSENIC IS FOUND IN THE URINE; WITH NOTES ON SOME NEW CASES OF POISONING FROM WALL-PAPER AND FABRICS.¹

BY JAMES J. PUTNAM, M.D.

NEARLY a year ago² I reported before this Society, twenty-five cases, hitherto unpublished, of patients under the care of physicians in this vicinity in whose urine arsenic had been found, which, as a rule, seemed traceable to arsenical wall-papers and fabrics. In most of the cases, the analysis of the urine had been suggested by symptoms more or less characteristic of arsenical poisoning, but in others, the symptoms were not such as would have been called characteristic, and the examination had been made chiefly as a matter of precaution.

Fabrics and wall-papers containing arsenic are so common in this community, if not elsewhere, that I was next led to inquire whether these cases might not indicate the wide-spread dissemination of small quantities of arsenic in a form suitable for ready absorption, and with this view I asked Dr. C. P. Worcester to undertake the analysis of a large number of urines collected in a routine manner.

The persons from whom the specimens were taken, were mainly patients presenting themselves at the

¹ Read before the Boston Society for Medical Improvement, March 10, 1890.

² Boston Medical and Surgical Journal, 1889, I, p. 235.