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FAULTY HYDROTHERAPY.

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BY

SIMON BARUCH, M.D.,

NEW YORK CITY.

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FAULTY HYDROTHERAPY.

By Simon Baruch, M.D.

Despite its antiquity water has not obtained a firm footing in therapeutics; despite its marked clinical results it still requires to be brought to the attention of practitioners; despite its espousal by the best authorities in ancient and modern practice and literature the average medical man is not familiar with its history, action, and merits. What are the reasons for this lack of appreciation of hydrotherapy existing in the medical man?

1. The difficulty of applying water systematically and with precision, arising from lack of facilities and the natural repugnance to water existing in the human mind.

2. The espousal of water as a remedy by empirics and ignorant laymen who have brought it into disrepute. (See *New York Medical Journal*, Oct. 26, 1895.)

3. The absence of instruction in hydrotherapy in the curriculum of medical schools. To this lamentable circumstance may be charged the ignorance of the rationale of the action of water and the unfamiliarity with its technique which are found among the majority of medical men.

In this article it is proposed to deal only with the latter, because it strikes the author as the chief obstacle to the recognition of

water as a remedial agent. The indifference to a definite technique has rendered its application in the hands of many unsuccessful and discouraging.

The latter is the chief cause of the indifference of the profession. Failure is the sure result of inattention to details. As a physician must judge the value of a remedy by his experience, it followed that failure to achieve the results which the experience of others had led him to expect has brought this remedy into disrepute, the fact unhappily remaining unrecognized that not the remedy but its application was at fault.

To stem this powerful current of prejudice and opposition has been my aim for many years.

Water is so simple, so easily applied, that any one seems justified in using it, and yet I say with a full consciousness of the import of my words that no remedy in the entire materia medica demands a like judgment and care in its application.

The following incident may serve to illustrate this proposition and serve as a warning:

In February, 1889, I presented the first plea for the Brand method of bathing in typhoid fever before the New York State Medical Society. On the day preceding this meeting a now eminent teacher of medicine informed me that he never intended to use so heroic a remedy, because he had seen the able visiting physician of the hospital in which he had served as an interne "kill a patient" by this treatment. Further inquiry elicited the fact that this so-called Brand bath consisted in wrapping the patient in a

sheet, placing her on a Kibbé cot and sprinkling her with ice-water until the mouth temperature showed marked lowering.

A brilliant young man, then already a teacher and hospital attendant, was bitterly prejudiced against a method of bathing of which neither he nor his justly eminent teacher knew anything. Both regarded the lowering of temperature as the chief aim of the cold bath, and looked upon any mode of applying cold water as a bath, losing sight of the difference in effect arising from a difference in technique.

A glance at the true object and rationale of the cold-bath treatment of typhoid fever introduced by Ernest Brand will clearly show the difference in effect arising from a deviation from its exact technique. Typhoid fever is an infectious disease, producing in the human organism a toxemia which overwhelms the nervous system, upon whose integrity the functionating capacity of all the organs depends. Death is due to the failure of one or more of these organs to properly functionate. It has been definitely ascertained that high temperature, which tradition has raised into a hydra-headed monster, is not the chief danger in this disease. If the pulse, respiration, nutrition and the secretions could be maintained near their normal standards, high temperature, significant though it be as a symptom, may well be disregarded as a lethal factor. Hence, when the illustrious Brand devised the method of bathing by which thousands have been saved from certain destruction, reducing the mortality of typhoid fever to almost *nil*, he distinctly urged the profession to direct

its main efforts to the sustenance of the nerve centres first, and to the temperature afterward. Although the latter was regarded as an index of gravity in most cases, the bath was not intended to combat it. A bath of 65° F., with friction for twenty minutes every three hours, whenever the body temperature reached 102.5° F., is calculated to arouse the nerve centres from their lethargy and give an impetus to all the dormant functions depending upon them. That a higher temperature of the water and prolongation of the bath would more positively reduce body heat is a fact well known to hydrotherapists, but it is a fact still unappreciated by the average practitioner.

The low temperature of the bath irritates the peripheral sensory filaments, from which the irritation is conveyed to the central nervous system, to be reflected upon the heart, lungs, and secreting organs. Friction adds to the irritation by multiplying it, the cold water being kept in motion; cold affusion over head and shoulders is added to promote the same object. To whip up the nervous system (as is done in poisoning by narcotics) is the object of the Brand bath, and right well is this accomplished.

The lethargic patient arises from the bath refreshed, invigorated, with brightened eyes, just enough fatigued to drop into gentle and much needed slumber — a halt, brief and feeble though it may seem, is made in the steady but sure progress of the toxic undermining of the nervous system. The latter again lapses into lethargy, not always evidenced, as I would have you bear in mind, by

delirium or stupor, but just as surely evidenced by the rapid and compressible pulse, the shallow and rapid respiration, pale or cyanotic hue of the countenance, deadly cutaneous pallor, diminution of urinary excretion of toxic elements, etc. Again the patient is submerged, again he is rubbed and douched, and again the enemy is thrown into confusion for a longer or shorter period. Thus step by step his advance is disputed. Oh, how weary and full of travail is the fight to patient, physician, and friends!

But day by day, with occasional disappointments, a fifth, or a quarter, or a half degree of temperature is gained; the heart maintains its vigor, the kidneys increase their work, the stomach receives more kindly the proffered nutriment, and sleep is won.

The enemy cannot be routed, the disease cannot be shortened, but we hold him in check surely and completely until his reinforcements fail. The bacterial life period reaches its end, the toxins cease to be evolved, and at last the physician stands conqueror of this deadly enemy. This is the true aim, the correct rationale of the Brand bath. Were temperature reduction the chief need, we would hold the key to the situation in our splendid coal-tar antipyretics; were pulse reduction the desideratum, veratrum viride would prove an "open sesame;" were nourishment the chief object, there is no lack of this in modern culinary and chemical art. But all these are as naught in the face of a toxemia which overwhelms the nerve centres of the most robust, as well as the most feeble, patients.

That the cold bath devised by Brand meets

the issue has been shown by the most incontrovertible statistical data in medical history.

Why deviate from the method except for good reasons? To wrap the patient in a sheet and then sprinkle him with ice-water, as was done in the case cited above, is a deviation from the correct technique of the typhoid fever bath. Such a procedure does not fulfil the main object of arousing the nervous system. After the first shock has passed no opportunity is given for reaction, because the sprinkling of ice-water continues; the cutaneous vessels and the elastic tissue of the true skin contract, as evidenced by cutis-anserina; the extreme cold imparted by the wet sheet, without remission, benumbs the sensory nerves and thus impedes the transmission of the shock and subsequent stimulus, even if the latter has ensued in an exceptionally strong individual. The absence of friction in this faulty technique (which in the Brand bath stimulates to reaction, and by widening the blood area of the skin cools a large quantity of blood) frustrates completely the true aim of the cold bath.

The surface temperature is indeed reduced by this improper method, but the blood is driven to the interior, congestions are favored, the organs are overloaded, and the patient emerges from such a bath (save the mark !) a shivering, cyanosed weakling.

Even such a sheet-bath as was used by the distinguished hospital attendant referred to could, by proper understanding of the rationale, be made to serve a useful purpose. If temperature reduction were not the object, but nerve stimulus; if the sprinkling were

done rapidly with water not less than 60°; if each part sprinkled were thoroughly rubbed with the flat hand of an attendant until warm, and thus every part of the body sprinkled, rubbed, slapped and warmed up until it no longer responded by warming up, the dangerous contraction of the cutaneous vessels would be obviated, the vaso dilators would be stimulated, a reaction would take place whose transmission to the brain would be salutary.

That the false procedure above quoted proved fatal is due to an error in technique based upon a misconception of the rationale of the cold bath in typhoid fever.

I am happy to state that both preceptor and pupil are now practicing the Brand method with success. They have mastered the technique and follow it closely with rare exceptions. That the best judgment must be applied to the technique of this treatment becomes apparent very soon to the observant practitioner. The ideal results obtained by Brand and others in 1200 cases without mortality can only be realized by following the exact technique of Brand. This consists of beginning the friction baths at 65° before the fifth day, and continuing them without fail every three hours, night and day, when patient is awake, so long as his temperature reaches 102.5°. V. Ziemmsen testifies whenever he deviated from the strict Brand method he had cause to regret it, and my own observation corroborates his experience.

I have repeatedly pointed out that even eminent clinical teachers have failed to obtain ideal results because they deviated from

the ideal technique, each one modifying it to suit his own fancy. That physicians must blindly follow the dictum of Brand or of any other is not demanded, but the Brand method, which is definite in its technique, must not be charged with failures attending its modification any more than Bergman's aseptic surgical technique should be charged with failures attending the neglect of any one of its exacting demands. For instance, the physician who does not begin bathing before the diagnosis is positively made by the roseola cannot expect that freedom from lethal complications which early bathing surely brings, though he bathe exactly according to Brand throughout the case. He will surely have a smaller mortality than another who begins regularly in the second or third week, or one who uses higher body temperatures as indications for the bath, or one who adopts higher bath temperatures to please the patient or his friends. I plead for attention to the *exact technique* of Brand in all cases not presenting distinct contraindications.

That a few such cases do occur my own observation has demonstrated. Hospital cases, for instance, rarely come in before the fifth day; hence the constant prevention of diarrhea, tympanites, hemorrhage and perforation is impossible. In private practice it is my custom to bathe so soon as the symptoms are at all suspicious. That benefit is derived from bathing in any febrile disease cannot be denied. While, therefore, it can do no possible harm, the early bath is an important step in the inauguration of the most successful treatment, if typhoid develops.

Professor Osler states, and his opinion may be confirmed by all who follow Brand's technique strictly, "that consciousness is restored, stupor is removed, the heart is invigorated, sleeplessness is diminished, and mortality is reduced to a minimum by these baths."

Such results can only be obtained by minute attention to all the details of the Brand method; the latter is an innovation upon all other cold-water treatment, be it by baths, douches, or affusions, which are to reduce temperatures.

I have dwelt so long upon this illustration of my subject because extensive observation and careful inquiry among practitioners in Germany and in this country have convinced me that to losing sight of the true principles of the Brand baths, and consequent too liberal deviation from its correct technique, may be ascribed the lack of appreciation of the therapeutic value of this method of bathing, and its consequent feeble recognition by the profession. Those physicians who have mastered its technique will agree with Professor Delafield, who said in a clinical lecture in December, 1892, at the Roosevelt Hospital, that "First, immersion in cold water is the only real treatment of typhoid fever; second, the only way to practice this treatment is the exact method of Brand."

The view of this justly eminent teacher is rendered more valuable for the purpose of illustrating my theme by the fact that on February 18, 1890 (nearly three years previously), Professor Delafield said in the New York Academy of Medicine, while discussing my paper on the treatment of typhoid fever,

that "he had no real experience with the Brand method of cold bathing; that the point brought out in the paper that in the United States we have never really tried this treatment was correct. It was a fact, he believed, that scarcely any one here had carried out the whole treatment thoroughly" (*New York Medical Record*, March 22, 1890, p. 336).

Here is an illustration of true scientific candor. A great teacher becomes convinced of the value of the Brand method and of the necessity of an exact technique; he at once puts it into use in his practice, and in three years gives his students the result in that pithy manner for which he is noted. Can there be a more telling illustration of the value of exact technique in hydrotherapy than these candid statements of this eminent teacher?

Physicians always insist upon exact dosage of medicinal agents, the exact time and mode of their administration, frequency of repetition, and even their exact preparation. I plead here for the adoption of similar care and attention to the prescription of water as a remedy.

That precision in technique is quite as important in the treatment of chronic diseases as in the acute may be readily demonstrated. That the medical profession has not yet accepted the idea is illustrated by the announcement of a certain hydrotherapeutic establishment which reads, "Give the bearer a douche, sulphur bath," etc.; the physician may strike out the bath "not wanted." One may as well write a prescription reading, "Give the patient a dose of quinine, mor-

phine, or sulphonal," without specifying exact dose and mode of administration. Such a prescription would be regarded as incomplete, indeed as absurd. That a prescription for a bath or other hydriatic procedure without exact statement of temperature, duration, pressure and method is equally absurd, needs but to be pointed out.

The import of pressure, temperature and duration of every hydriatic procedure requires to be impressed with emphasis. Every physician realizes the difference of effect arising from different temperatures, and yet we commonly read directions for cold baths, tepid baths, hot baths. By a cold bath is commonly understood a bath to which no hot water has been added. Such a bath in New York City would be 45° F. in midwinter and 75° in midsummer, as ascertained by exact observations in the Hydriatric Institute. That 30° would produce an enormous difference in effect goes without saying. And yet the exact temperature of a bath is rarely designated.

Just as the Brand bath has failed in the hands of those who modified or changed its technique, so has hydrotherapy in chronic cases failed because of inexact technique. I reiterate that temperature, pressure, duration and method should be prescribed and practiced with as much exactness as the dose, prescription and method of administration are stated in prescriptions of medicinal agents. The treatment of phthisis may serve as an illustration. There is no chronic disease whose intractable character is so well established, and yet I may say without fear of contradiction that it is more amenable to

treatment by hygiene, correct diet and a judicious hydrotherapy than many other diseases which are regarded as more difficult to treat. Especially in the earlier stages, ere the temperature becomes elevated and the pulse becomes rapid, when the chief manifestation is a general depreciation of the nutrition, which in the progress of tuberculosis becomes the main reason for the advance of the latter, I have observed favorable results from hydrotherapy which are striking and instructive. In the wards of the Montefiore Home for Incurables, where cases are observed by a large staff of expert medical men, and in my private practice, where microscopical examinations have been made of the sputum in the Vanderbilt Laboratory, and by other experts, these favorable results have again and again been verified. The proper technique in these cases was based upon improvement of the nutrition. That by a judicious application of douches, of moderate and low temperatures, such improvement may be obtained there is no doubt. The method evolved from practical observations which I have introduced at the Montefiore Home is a gradual but progressive accustoming of the patient to low temperature and high pressure. We begin with dilating the superficial cutaneous vessels and thoroughly warming the patient by a dry pack—*i.e.*, an envelopment in long-haired blankets or a hot-air bath, short of perspiration. Thus prepared the patient is subjected to a circular or needle bath under twenty-five pounds pressure at a temperature of 95°, gradually reduced in the course of one

minute to 85°, and followed by a fan douche of 90°, reduced daily by one degree at a pressure of twenty pounds until 65° F. and thirty pounds pressure are reached. Thus the stimulating effect of a stream of water thrown upon the surface under pressure counteracts the possible heat-abstracting effect of a water temperature, which is comparatively low because the patient had perhaps never been exposed to it. The shock to the sensory nerves is gentle, the reaction proportionately so. These are intensified daily until a decided reflex effect is produced upon the respiration, deepening it, the circulation steadying it. The heart becomes more vigorous; more oxygen is inhaled if the patient be made to walk gently in the open air after the treatment. The result is an improved hematosis, a better circulation in the stomach and other organs, a stirring up of the leucocytes—in brief, what is called a general tonic effect.

If this careful technique be not observed, if the patient be subjected to lower temperatures or higher pressures in the beginning, his reactive capacity would not be equal to the demand and the result would be serious and discouraging. To illustrate I may refer to a recent incident. A young hydrotherapist, recently returned from Germany, expressed great surprise that a case of phthisis which had been under hygienic treatment and diet, improving and gaining weight steadily, had begun to lose weight after douches had been used one week. To her question as to the probable cause of this result I replied that there was "something

wrong with the hydrotherapy used in the case." Upon asking her to detail the technique, she said that she had followed the plan adopted at the Montefiore Home—to dilate the cutaneous vessels before applying the douche. When she was asked how long the patient remained in the hot-air bath, the reply was "until she perspired freely." Here was the defect of the technique.

The object of the hot-air bath in phthisis and other diseases manifesting defective nutrition and a tendency to emaciation is to dilate the cutaneous vessels for the purpose of influencing reaction, but not to promote tissue change, as evidenced by excessive rise of temperature and perspiration. As the latter method is adopted in treating obesity, its inappropriateness in phthisis is at once apparent. Bearing in mind the feeble circulation in phthisical patients, a gradual education of their reactive power, a daily neuro-vascular discipline as it were, accomplishes results which are striking. I have published the records of cases in which weight was increased, cough, fever and bacilli disappeared, which have remained well and living in New York three years, though they had been condemned to exile by eminent consultants. I well remember a case in the Montefiore Home which gained thirty-three pounds. No specific effect—bactericidal, as is now the fashion, or otherwise—is claimed; the effect is solely and simply an improved nutrition and probably a more active circulation of leucocytes in the main vascular channels, which has been demonstrated by Winternitz and confirmed by Thayer and others.

In cases of neurasthenia, atonic and nervous dyspepsia, simple chlorosis, the results of hydrotherapy applied with judgment and skill in building up nutrition and improving hematosis are striking. As Dr. Draper has justly said in his valuable paper on Hydrotherapy, read before the Academy a few years ago, "its results in certain chronic diseases are striking; it seems to be more effectual than medicines."

There are many cases, indeed the large majority in the hands of the general practitioner, for whom institutional treatment is not available, and who demand immediate attention. To manage these successfully demands a closer study and more thorough acquirement of the rationale and technique of hydrotherapy. Such enlargement of knowledge will redound to the benefit of patient and physician alike.

An example of faulty hydrotherapy may be of interest here. In a published lecture on neurasthenia, delivered by an eminent neurologist, the following may be found: "The cold water treatment in the morning is apt to bring about a very beneficial change. I will suggest various methods of applying the treatment, which you can use in all cases, rich or poor, old or young. The top of the head and the nape of the neck are points of attack. Have the bath-tub one-third full of lukewarm water, so that the patient may stand in it without getting chilled; then, if the bath has a douche attached, you may allow the shower to play on the top of the head and then down the nape of the neck; or you can slap the nape of the neck and

the spine with towels wrung out of very cold water; or let him take a large sponge dipped in cold water, put it on the top of his head and let the cold water run down his back. Nothing produces so good an effect on the nervous system as the trickling of cold water; it is not so good simply to wash with cold water; trickling out of a sponge is the proper way to apply cold water. No matter what the origin of the neurasthenia may be, it is best to begin with this cold-water treatment."

Note the indefiniteness of this technique. According to the locality in which *cold* water is administered its temperature may be 40° in midwinter or 80° in midsummer. And yet this lecturer says not a word about temperature. The trickling of cold water over the body needs but to be mentioned to provoke a feeling of chilliness; playing a douche of cold water over the head and spine of a neurasthenic of the excitable type would set him wild, while the same treatment may benefit the depressed neurasthenic if it be brief and daily and gradually lowered.

The recklessness of these suggested modes of applying cold water becomes more glaring when compared with the same lecturer's directions for the drug treatment. He says: "I often see cases where strychnia is needed badly. You may give any of the salts of strychnia. The proper way to administer the drug is in pill form or in mixture. Begin with $\frac{1}{60}$ of a grain three times a day; if the patient tolerates strychnia the dose should be increased until he takes $\frac{1}{30}$, or $\frac{1}{20}$, or even $\frac{1}{10}$ of a grain three times daily."

This lecturer is equally explicit with regard to phosphorus, stating the preparation, dose, combinations, etc. If he had followed this course in describing the water treatment by stating the temperature of cold water and of the *very* cold water; the pressure of the douche, which from the height of a few feet is a chilling drizzle, while from a height of fifty or sixty feet it stings and arouses the vaso-motor nerves to an intense and pleasant activity; the duration of the treatment, which if left to the patient often bears unhappy consequences; he would not have left them ignorant of the proper method. I am glad to say that this teacher has recently published a valuable work on nervous diseases, in which the directions for hydrotherapy are quite precise and well considered.

Another eminent teacher advises neurasthenics to plunge into a tub of warm water (temperature not being stated), then allow cold water to run into the tub until the water surrounding the patient is cool; this temperature again being left to the judgment or caprice of the patient. Here the very common error is committed to obviate shock. This is the horrid bugaboo of inexperienced prescribers of cold water, who disregard the fact that the reaction following the shock is the aim of hydrotherapy when applied as a tonic or as a nerve stimulus, and that the reaction is exactly in proportion to the preceding shock. The bath just referred to does not fulfil its object properly, because the surface vessels are relaxed by the warm water; reactive capacity is diminished by its calming and sedative effect. The vaso-constric-

tors are depressed. The subsequent cooling of the water finds the sensory nerves unprepared and chilliness usually results, unless the patient be more robust than is the average neurasthenic.

It is unhappily a very prevalent error to regard the most agreeable bath as the most salutary. We do not so reason in the application of medicinal agents, of electricity, or of diet. And yet the application of water may be made agreeable by gradually accustoming the patient to lower temperatures, slowly reducing them every day or two, making the application brief at first and increasing the duration and pressure day by day. The prime essential, however, should always be borne in mind that *reaction is our aim*, that this cannot be evoked without some shock, that the more intense the latter the more effective the reaction; but the more brief it is, the less unpleasant. If the physician bear in mind that his object in treating such a case is an increase of the quantity of blood circulating in the cutaneous vessels, an enhancement of the nutrition, a stimulus to the entire nervous system, he will endeavor to so order the technique, provided he has mastered its details, as to evoke this salutary reaction. A chlorotic girl, for example, should stand in a tub containing twelve inches of water at 100° to protect her against chilling of the feet. Water at 90° F. or lower, according to the assured reactive capacity of the patient, should be ready in a large basin or a small tub within reach. The mother or attendant squeezes a small crumpled up towel or two bath gloves out of this water and rubs

the patient gently, occasionally pressing the water against the body, till the whole body is so treated. The rubbing should be done rapidly and chilling should be avoided. The patient is dried with a soft linen towel, which acts like blotting paper; then gentle friction is made with a Turkish towel. Where reactive capacity has been improved no friction should be made. Such a bath will prove refreshing and invigorating and prepare the patient for a more effective one without a severe shock. The temperature of the bath water should be reduced daily one or two degrees until 60° F. are reached; then larger quantities of water should be poured upon the body by squeezing a large sponge quickly over different parts. Later, pitchers or basins full may be poured over the body with some force; each change beginning with 90° and reducing daily one degree or more until 60° are reached. Thus day by day the reactive capacity may be elevated and tested, and no harm can ensue.

As the shock and reaction increase day by day, the patient will emerge from the treatment with a ruddy hue. The increased circulation will endure more and more every day, languor and loss of appetite will cease, and if the patient does not recover under this domestic treatment, douches of the same temperatures and with a pressure of twenty-five to thirty pounds, preceded or not by hot-air baths, will bring about a final restoration of health. "It goes without saying" that other hygienic agencies, the removal from unfavorable environment, properly regulated exercise and rest, enhance the value of hydrotherapy in all cases.

For the attainment of satisfactory and definite results, however, correct technique is paramount. This cannot be too often reiterated and impressed upon the profession. Acute cases like typhoid fever and pneumonia are under constant observation of the physician, who may at once note the result of an improper hydriatric technique and modify it, or, as is more often the case, relinquish it altogether. In chronic cases much damage may be done before the physician discovers it, if the treatment be not in the hands of trained and intelligent attendants who are under medical supervision. Too often the details are left to laymen because physicians have not received instruction in the rationale and technique. The result is as Dr. Vogl, General stabsarzt of der Bavarian Army (*Münch. Med. Wochenschrift*, 27, 1896), says: "Physicians are themselves to blame if hydrotherapy is chiefly practiced by laymen, who know as little of the disease they are treating as they do of the effect of water, and thus damage not only the patients who confide in them, but also the cause of hydrotherapy."

During the past summer I visited in Germany and France twenty-five institutions in which hydrotherapy is practiced largely. I was astonished and chagrined to find among the number only four which had a stationary thermometer to indicate the temperature of douches, and only two which had gauges in use to indicate the pressure applied. How can these gentlemen control the technique with any degree of certainty?

It occurred to me that a mild and graduated hydrotherapy, such as is described above

as in use in the Montefiore Home, would be capable of early adoption, and thus afford the patient great aid in improving his condition without the lapse of precious time.

To avoid shock and gradually educate the patient's reactive capacity has been demonstrated as a good rule of practice in my clinical observation. To enable me to accomplish this end with precision I have, without neglecting other hydriatic procedures, resorted chiefly to douches, with which I am able to grade the temperature, duration, and pressure.

For this purpose I have constructed an apparatus which has been used for several years in the Montefiore Home and the Hydriatic Institute in this city, in the German Hospital of Philadelphia, and in several other institutions. By this means it is in our power to exactly adapt the necessary shock and reaction to the patient's capacity and endurance.

Gentlemen: I hope to have clearly demonstrated:

1. That the therapeutic application of water demands at least as much care as the use of medicinal agents.

2. That owing to the flexibility of water as a remedial agent, greater demands are made upon the practitioner than in the use of medicines.

3. That the best results may be obtained only by following an exact technique in each case.

4. That the reason that different results are obtained by different physicians from the application of water may be found in the technical errors committed on account of

an erroneous conception of the rationale of hydrotherapy.

I hope to have this evening aroused sufficient interest in hydrotherapy to induce you to acquaint yourself more intimately with its technique.

In the discussion which followed this paper Dr. I. Adler said that in the most modern medical view hydrotherapy plays an important rôle, and that, as Dr. Baruch had emphasized, the application of water is so lax that clinically and diagnostically much less is accomplished than would be otherwise. But this is not alone the fault of physicians, but perhaps as much of those who specially cultivate hydrotherapy. The latter seems to be based more on personal impressions than scientific data. We cannot accept water therefore on the same basis as our medicinal agents. As an example, the physiological action of strychnine upon the spinal cord is exactly known, but of water we cannot say this. There should be a knowledge of the physiological action of water ere we are asked to accept it as a scientific remedy.

Dr. Adler thought it was going too far to accept the baths as the only remedy for typhoid. The statistics cited by Dr. Baruch to prove that the mortality has been reduced to almost nothing are new to him. Dr. Adler has used the bath more in hospital than in private practice, where it is more difficult to apply. One may have very good results without baths, although the latter are one of the very best agents where the heart is feeble, delirium is intense, and somnolence occurs. But he could not accept Brand's rule,

supported by Dr. Baruch, that 102° F. should be the signal for baths. Some patients become delirious at 100.5°; others may have 105° and not be delirious. Dr. Adler also confessed his confidence in small doses of antipyretics, which afford much relief, although he does not approve of their routine application for temperature reduction.

Dr. L. Weber said that he always used cold baths in typhoid in the absence of kidney complications; he begins the treatment with a large dose of calomel to clean the intestinal tract and disinfect it. In private practice he has not often had an opportunity of applying the Brand method. There seems to be a silent but active opposition to it among the nurses. There is no doubt that Brand's method offers great advantages, and is specially adapted for enhancing the resisting capacity of the nervous system. Dr. Weber uses antipyretics in small doses for temperature reduction.

In neurasthenia Dr. Weber has seen much of hydrotherapy. It seemed to him, however, that many of these cases recover under any treatment.

Dr. A. Rose opposed Dr. Adler's views that hydrotherapy was not based upon sufficient scientific investigations and experiments. It would seem that the statements of quacks are more regarded than these scientific experiments. He referred to the pletysmograph of Winternitz, by which the passage of blood driven from one part of the body by cold baths was demonstrated in other parts. Dr. Rose referred to his experience in erysipelas and his observations with the permanent baths in obstinate rheumatism.

Dr. A. Seibert believed that the complaints made by hydrotherapists that their doctrines have not been generally accepted by the medical profession are to be charged to their own writings, in which they use many hyperboles. The Brand bath is not responsible for the reduction of mortality of typhoid fever during the past thirty years, but rather to the general improvement in the treatment of the disease. A large acquaintance with statistics enables him to say that many sins are committed by statistics. In his hospital practice Dr. Seibert uses the Brand method only on patients who are received in a somnolent condition. He prefers to reach the seat of the disease by cleaning and bathing the intestinal tract rather than to cool the skin and thus excite the nervous system.

Dr. Seibert regards as novel the claim that the early adoption of the Brand method is capable of affording absolute protection against complications. He refused bathing in pneumonia cases, and stated that an experience of nineteen years warrants him in proposing the doctrine that the patient's chances in pneumonia are better the less he sees of the physicians.

Dr. Talmey believes that one reason for the non-acceptance of hydrotherapy lies in the objections of the public; another reason lies in the insistence of the hydrotherapists upon so many details, which no ordinary man is supposed to be capable of executing as well as they.

Dr. Baruch closed the discussion by regretting the brief time at his disposal. He insisted that much proof exists showing that

the action of water is more rational and scientific than that of any other remedy. Very little is known of the action of strychnine in non-toxic doses. It may be administered for days, weeks and months without any subjective or objective evidence of its presence in the pulse, blood-pressure, respiration, etc. Our knowledge of its effects in disease is almost entirely derived from non-toxic doses. Of water we know much more. It may be dosed with precision afforded by a latitude of seventy degrees of temperature (35° to 110°), a duration of a second to many minutes, a pressure of from one to forty pounds. We also have various methods of applying it—packs, baths, douches, etc.—by which its effects may be graded. A few days ago he subjected an attendant in the Hydriatric Institute to a tub-bath of 80° F. for ten minutes. The effect was at once pronounced upon the pulse as ascertained by the finger and the sphygmograph; the blood count showed an increase of 700,000 red cells and 1500 white cells in blood drawn from the lobe of the left ear. Is any analogous experiment with non-toxic doses of strychnine on record? So far from there being a lack of scientific experiments of the action of water, these abound within the past five years, having been made in Zuntz's and other laboratories by Breitenstein, Loewy, Knoepfelmacher, and others. Thayer, of Johns Hopkins Hospital, has confirmed the statements of Winternitz and Rovighi that the red and white blood-cells increase after cold water applications; the sphygmomanometer has demonstrated that the force of the heart is increased by them;

Vinaj has shown with the ergograph of Mosso with exactness how the muscular power is enhanced by them. Roque and Weil have shown that the urotoxic coefficient of the urine in typhoid fever is increased many fold after the use of the cold bath.

That early cold baths prevent complications has been demonstrated as has no fact in medicine before. Dr. A. Vogl, Medical Director of the Bavarian Army, has collected from the records of the Military Hospital of Munich all the cases of typhoid fever which were treated during a period of forty years in this hospital. He gives the type of the disease each year, the symptoms, the treatment, mortality, and results of autopsy. Since the strict bath treatment was adopted he found the mortality reduced to 2.7 per cent., while under other methods of treatment it had ranged from fifteen to thirty per cent. This proves that the result is not due to a change of type in the disease which the records show to have varied from year to year during this long period, but that it is entirely the result of the bath treatment which prevented lethal complications. Although the Brand method must be applied before the fifth day, every fever patient may be bathed with advantage. Dr. Baruch stated that he invariably uses it in private practice, that he declines to treat the patient otherwise, and that he has been dismissed from a case but once for this reason.

The most superficial study would demonstrate that water produces a thermic and mechanical excitation of the cutaneous nerve-endings which operates upon motor and sen-

sory tracts as a reflex upon the circulation, respiration, and secretions. These demonstrations are so abundant in literature that Dr. Baruch regarded it as an act of supererogation to reiterate them here.

That a woman may be aroused from syncope by the simple sprinkling of cold water upon the face is known to almost every lay person, and the scientific explanation of this process is recognized by every tyro in medicine to be a powerful irritation by cold, which is conveyed from the cutaneous nerves to the central nervous system and thence by reflex to the vagus. This seems perhaps too simple; rabbits and guinea-pigs are not required for the "scientific" explanation of this powerful effect. If such sacrifices are demanded, however, to establish water as a scientific remedy, the classical experiment of Maximilian Schüller upon trephined rabbits may be offered. Schüller exposed the vessels of the pia, and placing the rabbits in water at different temperatures observed the effects of these applications on the animals; he demonstrated more clearly than has ever been done in the study of any medicinal agent the effect of these water applications. He showed conclusively that the latter called into action a hydrostatic effect which makes water a powerful agent for influencing the circulation of blood in an animal. Besides, Winternitz and others have demonstrated in the most exact manner by laboratory experiments that the corpuscular elements of the blood are subjected to such decided changes by water applications that no medicinal agent is capable of approaching these effects.

A very fruitful but sadly neglected field lies here before the practical physician who does not meet hydrotherapy with a shrug of his shoulders.

To Dr. Talmey's insinuation that hydrotherapeutists are so insistent upon minutiæ that "it is difficult for an ordinary mortal to follow their directions," he would reply that modern hydrotherapeutists are constantly laboring to make hydrotherapy the common property of physicians. He would only protest against the tendency of physicians to leave the water treatment of chronic cases to bath attendants, or other nurses who claim to know all about it, but really do not know anything but the mechanical part. Does not every physician who orders a cold bath in typhoid fever give the nurse directions regarding temperature, friction, drying, duration, etc.? Why then should physicians leave such important details to a nurse when ordering a wet pack, douche, etc., for a chronic case? Would it not be far easier for physicians to consult some work on this subject and use their own judgment in ordering the necessary temperature, duration, etc.? It is just as absurd to leave these important details to self-important bath nurses as it is to leave the doses, etc., of a medicine to the druggist to prescribe and administer. Indeed the latter would be safer, because the druggist is at least an educated man. As Vogl has said, leaving the treatment in the hands of lay people has brought hydrotherapy into disrepute. He warns the profession against this error.

With regard to clinical observations this

discussion again makes evident the fact that many physicians have occupied themselves with hydrotherapy insufficiently. In reply to Dr. Seibert's statement that the Brand method is not entitled to the credit of reducing the mortality of typhoid fever, Dr. Baruch referred to Dr. Vogl's statistics for positive evidence to the contrary. Moreover Prof. C. Gerhardt, of Berlin, said in his recent opening lecture before his class at the University: "The mortality of typhoid fever has been reduced by the Brand cold-water treatment to one-fourth."

That Osler formerly regarded heart feebleness as a contraindication to cold bathing does not disprove the fact that he is now its warm defender, since he applies its technique correctly. In the first edition of his book on Practice he omitted the frictions from the bath technique; this error has been corrected in the later editions.

That the hydrotherapists "resort to many hyperboles in their writings and lectures" may, as Dr. Seibert states, be true. But the most eminent physicians also resort to "hyperboles" when they have mastered hydrotherapy and applied it correctly. This he proceeded to demonstrate.

Prof. F. A. Hoffman, of Leipsic ("Lectures on General Therapeutics," 1892), says: "Herein lies the unexcelled value of cold water in therapeutics; we invigorate the nervous system and thereby enhance the cardiac capacity" (page 88). "I am convinced that in time all chronic organic diseases will come into the domain of the bath treatment" (page 392). "Cold affusions have justly been

elevated to become the chief remedy in catarrhal pneumonias of children" (page 130).

Prof. Wilhelm Erb, of Heidelberg, writes in Ziemssen's Cyclopedia: "Among the most effective and powerful agents in our branch are cold and cool baths and cold-water treatment. Its results in all possible chronic nerve troubles are extraordinarily favorable. We have few remedies which exert a similar powerful influence upon the nervous system."

Professor Kussmaul, of Strasburg, writes: "There is no doubt that the belief in the prescription is waning among educated people, and the confidence in dietetic remedies and the remedial value of water is in the ascendant. Water especially has won for itself a constantly growing confidence as a remedy, because unlike any other it may be applied by reason of varied temperature and methods to the most varied curative purposes."

Semmola, the recently deceased professor of therapeutics at the Naples University, whose work has been translated into German and supplied with a laudatory preface by Nothnagel, writes: "Hydrotherapy excites cutaneous activity and with it all functions affecting tissue change and organic purification, so that frequently real marvels of restoration in severe and desperate cases have been obtained by it."

From Prof. V. Leyden's Berlin Clinic, Klemperer reports (Publications of the Hufland Society, 1896) that "in hydrotherapeutic effects we observe a quite extraordinary and incomparable stimulation of the nervous system which is exerted upon the various organs. . . . In our clinic we regard

hydrotherapy as quite an essential factor in bronchial asthma. . . . Much greater is its rôle in nervous diseases of the heart—but it plays quite a powerful rôle also in organic heart diseases. . . . As much more effective do I regard these hydrotherapeutic influences in stomach and intestinal diseases. Here hydrotherapy remains the most powerful factor. . . . I may say briefly that we have treated the most varied pathological conditions of the gastro-intestinal tract—chronic constipation, diarrhea, enteralgia—hydrotherapeutically with great benefit."

Dr. Baruch said that he might quote many "hyperboles" from the writings and lectures of the most eminent clinical teachers. These gentlemen have not been deterred by the "hyperboles of the hydrotherapists;" they have investigated the subject, as have Delafield, Peabody, Osler and Draper in our own country, and have become its advocates.

One thing Dr. Baruch desired especially to emphasize, namely, that in his article, as in all his writings, he has never lauded water as a universal remedy. Dr. Baruch claimed that his observations in hydrotherapy were gathered in the capacity of family and hospital physician, in which respect he stands alone. As a practitioner of thirty-five years Dr. Baruch did not feel prepared to throw aside calomel, salicylic acid, morphine, quinine, and other approved remedies. Despite this fact he felt compelled to acknowledge that water had served him well in the most desperate chronic cases after other most approved remedies had failed in his own hands as well as in the hands of colleagues.

For this reason he would say with Pindar, *αριστον μέν ὑδωρ*. And herein he felt himself sustained by the most eminent clinicians of the present time, whose opinions he desired to impress upon his colleagues.

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EDITORIAL OFFICE, 222 South Fifteenth St., Philadelphia, U.S.A.

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