Original Articles.

REMARKS ON THE DESIRABILITY OF A MORE CAREFUL STUDY AND EXTENDED USE OF HYDROTHERAPEUTICS.¹

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THE object of this communication is to introduce a discussion on the subject of the external uses of water, about which one hears, it seems to me, too little among us. I cannot claim to bring forward new observations. The monograph by Dr. Simon Baruch, of New York, which has recently appeared, states the case with great thoroughness, and if I could believe that the members of the Society were familiar with its contents I should feel that I had nothing to say beyond expressing a desire that the plea which he makes for accuracy and fidelity in the application of principles and attention to details should lead the rest of us to test the correctness of the reasoning on which the plea is based.

In fact, however, so far as I can judge from conversation with my friends, there are but few physicians who make anything like as systematic or scientific a use of this treatment as is practicable even in private dwellings, and there is no institution in Boston, under the guidance of a physician competent to study the subject as it deserves, or to whom one may send patients with the confidence that they will be judiciously treated, or treated in accordance with one's own ideas of what is needed, though there is reason to hope that this lack may soon be remedied. Most of the "water-cures" and Turkish-bath establishments of the present day, though well appointed, are on no higher plane, as regards the needs of scientific medicine, than those of Northampton and Brattleboro half a century ago. Excellent arrangements for giving these treatments in the best manner have, however, recently been introduced at the McLean Hospital, and have been in actual use at the State Asylum in Danvers for a number of years. The same may be said of several prominent hospitals and sanatoriums in various parts of the country, and I am sure that the time will come when no large general hospital will be without suitable devices for this purpose.

It is not too much to say that the growing interest in the subject is due largely to the intelligent and persistent advocacy of Dr. Baruch, though there are several other American physicians who have made valuable contributions to our knowledge of the subject. A few individual physicians doubtless advise baths extensively in their private practice, not to speak of those who employ them for typhoid cases or who are experimenting with the Schott treatment of cardiac disease.

Although some of the principles which underlie the external use of water in disease are fairly clear, others are still obscure, and it requires thought and practice to apply either sort in a given case.

The circulation of the blood, the motion of the muscular viscera, the processes of nutrition are largely reflex phenomena, and the combined stimuli induced by thermal and mechanical excitations acting upon the large areas of the skin, and carried by the countless nerves which terminate there, form an important

source of this reflected activity in health and the source which is most available for the manipulations of the physician in disease.

The diseases which are susceptible of being favorably influenced by the proper use of water cover a large range. The application of this treatment to the acute fevers, not only typhoid, but the exanthemata, pneumonia and bronchitis, is of course particularly interesting. On this point there are many physicians here who are better able to speak than I am, but, if I am not mistaken, the opinion is gathering strength, if it is not, indeed, fully accepted, that the true aim of the measures employed is only in part to reduce temperature, and in still greater measure to raise the tone of the nervous system so that the disease can be withstood, and to increase the elimination of toxins.

The success claimed by Dr. Baruch and the many observers cited by him, in treating phthisis on these same principles, is surely enough to justify further trials in this line.

As regards the more chronic affections, characterized by debility, anemia and neurasthenic states, I can corroborate from my own experience the favorable statements made by others. My interest in the matter was roused many years ago, and was increased by a visit to the institution at Passy, patronized by Charcot, and by reading a brief but clear and sound treatise by Runge, of Bad Nassau, and, later, through becoming familiar with the excellent little monograph by Dr. Mary Putnam Jacobi on the use of the wet-pack followed by massage in the treatment of anemia. Since then I have had many patients—among them some who were very feeble—treated by means of wet-packs and drip-sheets and similar measures, and the impression first formed of the value of this treatment has been only strengthened by subsequent experience. I should now feel that I had not done justice to any but the lightest cases of these sorts without prescribing baths of the best kind available.

Where, as often happens, it is out of the question for the patient to have the aid of a skilled assistant, I try to bring it about that the noon hour, before the midday meal, shall be given up to the treatment and its accessories, this time being chosen because the power of reaction of a feeble patient is usually greater then than either earlier or later, especially if the night's sleep has not been refreshing, and also because, after the stimulus of the bath, and the light exercise which should follow it if the patient's strength allows, the appetite and power of digestion for the next meal are increased. In every case the bath is preceded by a rest in bed, partly to ensure against the failure of reaction because of fatigue, partly to make certain that the skin shall become warm, and even hot, before the bath is taken. For this purpose the patient ought to undress and be tightly wrapped, by an assistant if practicable, in a coarse blanket over which other blankets are to be thrown. It is not well that any considerable degree of perspiration should be induced unless it is desired to get the special effects of this process. There is, indeed, no objection to bathing in cold water during perspiration, but the warm moisture macerates the epidermis, and by its rapid evaporation on the removal of the blankets the patient is needlessly exposed to the danger of taking cold. As regards the bath itself, I have followed various methods, such as will be spoken of a moment later. After the bath the patient should dress partially, so as

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to prevent evaporation, and may then take a few light calisthenics involving breathing movements and exercises for the hands and feet, or may dress completely and walk a little about the house, or out of doors if desired, and then take lunch or dinner. Where the noon hour has not been available I have advised the bath in the morning on rising or towards the end of the afternoon, before the evening meal.

I should be glad, if time allowed, to rehearse the highly interesting evidence which has been collected, through experimentation and clinical observation, as to the immediate and remote effects of various sorts of water applications upon the circulation in the skin and the deeper parts of the body, the heart's action, the respiration, the muscular power, the digestion, the general metabolism, the excretion of urine, the efficiency of the nervous system, even though in so doing I could only cite the observations of others. But as I aim now at nothing more than to bear testimony to the importance of the subject, I shall limit myself to a brief discussion of a few practical points on which my own experience enables me to speak.

A variety of temporary effects follows the immersion of any considerable part of the body in water which is cold enough to act as a strong stimulant, but the effects which are of chief importance in the treatment of chronic diseases are those which concern the distribution of the blood in the different parts of the body, the increased production of heat, and the increase in metabolism and digestive power. It is not improbable that the strong sensory stimulus affects the nervous system in such a way as to directly influence nutrition, and that the increased heat production which follows the application of cold is due to an action of this sort exerted on the muscular system, not necessarily leading to actual muscular contraction, but the whole subject of the trophic functions of the nervous system is still obscure in all its details.

There are two well-recognized factors by which the redistribution of the circulating blood is brought about. One of these is compensatory hydrostatic pressure, the other involves the co-operation of the vasomotor nerves; and both influences powerfully affect the circulation in the viscera. The peripheral blood-vessels are capable of holding a large amount of fluid, and the ebb and flow produced in the skin, associated with the reflex contractions and dilatations in the visceral arteries, strongly affect the circulation in the digestive and blood-making organs and in the nervous system. It is certainly no matter for surprise that the urine and the urea should be found to be excreted in larger quantity, and other nutritive effects of analogous kinds produced.

If the clinical benefits were confined to the immediate results of these single reactions they would probably be relatively slight, but inasmuch as there is good reason to believe that the waves of vascular contractions and dilatations which are excited by strong cutaneous stimulations are only an accentuated form of the normal waves of which the healthy blood-vessels are constantly the seat, it is reasonable to conclude that the effect of a cold bath is not exhausted in the production of its immediate results, but tends to re-accentuate a function which may have fallen into abeyance. Modern physiological research justifies us in believing that the dilatation as well as the contraction of blood-vessels is an active phenomenon, and that periodical alternations of contraction and dilatation of the arteries

throughout the body are more or less continuously in progress in states of health, and materially aid in promoting the circulation.

It is generally admitted that the occurrence of the so-called "reaction" is an essential indication that the effects of a cold bath are likely to be favorable, but it may be worth while to inquire what is meant by a "reaction," and what are the signs of its occurrence and those of its failure to occur? So far as the skin is concerned the reaction is of course the return, in increased volume, of the blood driven out by the impact of the cold application. It is a generally accepted fact that when this cutaneous reaction occurs and does not soon give place again to a secondary vascular cramp accompanied by a sense of chilliness the result of the cold application has been in so far satisfactory. As has already been stated, this return flow of blood to the skin is an important causative factor in the modification of the internal circulation, on hydrostatic principles, but the fact of its occurrence is also of value as a sign that the nervous system has been able to meet the demands made upon it in bringing about the deeper changes which are, in themselves, of still greater importance. No great harm might follow if the skin failed to react, provided this was all, but when the reaction does not occur in the skin we have reason to believe that compensatory hyperemias and other impairments of circulation are present elsewhere, and that as a consequence of this the resistance of distant tissues and organs may be lowered sufficiently to permit such results as bacterial invasion of the mucous membranes.

It is in this that "taking cold" consists, but it is noteworthy that this result, and also the persistent vascular cramp of the cutaneous vessels which often occurs at the same time and which friction only with difficulty overcomes, is more apt to follow a prolonged exposure to slight cold, like that afforded by exposure in rooms with cold, damp walls, or contact with wet clothes or the cold and damp ground, than it is a brief immersion in even extremely cold water. In other words, so far as "reaction" is concerned, it is more likely to be prompt and complete the more nearly the vasomotor system is called upon to respond up to the maximum of its capacity. It is for this reason that it is safer as well as more beneficial to train the patient to bear colder and colder baths and more and more complete immersion in them. But this training should, of course, take into account not only the patient's power of reaction for the moment, but also whether this reaction is maintained, and whether its maintenance costs more outlay of nervous strength than the patient can afford. As a rule, the internal temperature of the body is not actually lowered much by a brief though sharp cold bath; not nearly so much, for example, as it would be in a much warmer bath of longer duration. For the cold contracts the vessels of the skin and so prevents much radiation in the first instance, while, later, if reaction occurs, that means that compensatory combustion is taking place in the muscles, while if reaction does not occur that means the cutaneous vessels remain contracted. Nevertheless, the outer layers of the skin are of course cooled down, and this loss has to be made good. Also, if there is much exposure after the bath, or if sufficiently warm clothing is not worn, or if the patient's heat-producing power is defective, the internal temperature may fall to some extent and remain low for some hours. Some obser-

vations made upon himself several years ago by Dr. E. W. Emerson, who was at that time an interne at the Massachusetts General Hospital, where he was obliged, after the bath, to go about for several hours in cool shady rooms, give proof that this occurrence is an actual danger. Dr. H. P. Bowditch has also informed me that he has calculated that during a cold bath of four minutes his loss of heat was eleven times the normal amount, but it must be remembered that cold baths are usually taken at a time when the skin has been artificially warmed up and can afford to part with some of its heat, and also that the fact is, I think, true in general that the rectal temperatures do not change materially under the influence of a brief bath even in water of 40° F.

This leads at once to the question, what are the best means to secure the reaction from a single cold bath, and what the best means of preparing patients to endure cold baths in general and to get benefit from them?

The most important point is that the skin should be warm before the bath, both in order that the stimulus may be greater by contrast and the abstraction of heat from the blood less. It should here be noted that *being warm* and *feeling warm* are not synonymous terms. A person who has just come in from an exhilarating walk on a cold day may feel perfectly comfortable and yet his skin may be cold, while a person who has just got up from a warm bed may shiver when the cool air strikes him, and yet his skin may be warm, and the latter person may be in better shape for a cold bath than the former. This necessity of having the skin warm of course constitutes a reason, in addition to various others, why the morning hour is appropriate for a bath. I cannot help believing, however, that another element comes in here, namely, that of habit, which makes the nervous system prone to respond to that particular stimulus in that particular way, just as at a later hour it is prone to respond to the stimulus of pressure in the rectum.

Warmth of the skin can be secured both by blankets, as already indicated, or by the prolonged warmth of the bed, or by hot-air box-baths, which are now to be had in a convenient form for household use,² or by allowing a hot bath to precede the cold. The hot-bath method is convenient, but unless the cold affusion follows it quickly there is some danger of taking cold. Runge gives the rule that when the cold bath which follows the hot is of less than a minute's duration the aggregate effect is that of a hot bath, if more than a minute, that of a cold bath. Of course no such rule as this can be absolute. Besides the preparation of the skin the reaction may be assisted by friction, both during the bath and after it. It is perhaps unnecessary to dwell on this point further than to say that one immense advantage afforded by having trained assistants, and still more by the apparatus that is to be had only at good institutions, is that friction is secured in these ways on a much more effective scale. The rubbing with the hand of the assistant while the patient is partly or wholly submerged, the stimulus of vigorous stroking through a coarse linen sheet wet with cold water, and, above all, the stimulus of a powerful douche, often transform a cold bath from a chilling process to one in which the skin is sure to come out pink and vascular.

The graded system of baths recommended by Dr. Baruch for persons unaccustomed to such manipula-

tions and in feeble health is something like the following:

In the first grade the patient is wrapped in coarse blankets and one part exposed at a time, so that water may be dashed on by the hand of an assistant, at perhaps 80° or 85° F., the temperature being then reduced every day by two or three degrees, down to 50° or 60°. The patient then graduates perhaps to the "half-bath," in which he sits in water which may be at first, again, at 80°, but should be made lower day by day. He may next sit or stand in an empty tub, or, if desirable, a tub containing hot water for the feet, while several basins or pitchers of water at 75°, gradually reduced, day by day, to 50°, are poured or even thrown with some force over the shoulders. The "sheet-bath" (sheet wrung out) or the "drip-sheet" (sheet dripping) may come next, or instead of them the "wet-pack," which consists in the rapid application to the naked skin of a coarse linen sheet well wrung out of water of a temperature of from 60° to 70°, blankets previously disposed for the purpose being next wrapped, in accordance with a definite technique, snugly over the body so that all air is excluded. The "wet-pack," although the first part of it is a complete cold bath in itself, soon becomes a warm application, and is therefore to be the precursor of an affusion or cool or cold douche, or drip-sheet, etc., according to the patient's conveniences and strength.

In conclusion I will speak of a few points on which I think physicians are apt to hold fallacious opinions:

(1) Is a "shock," as from sudden application of cold water, useful or objectionable? The latter view is often maintained, both by patients and physicians, but the former is correct, provided only that the shock is proportioned to the habits, and the capacity for reaction. Patients are apt to dislike the "shock" of cold water, and if they are feeble or nervous it may, if severe, frighten or fatigue them. For this reason, when an unfamiliar method is first used the application should be as warm as 85° to 90°. This will feel cold if the skin has previously been warmed to 100° or higher. On the other hand, the common practice of letting cold water run gradually into a previously hot bath, so that the temperature is slowly lowered and "shock" avoided, is an objectionable one, and much less likely to be followed by a good reaction than a more sudden change, especially if the latter is associated with smart friction, as in the case of the drip-sheet or forcible cold affusion given by another person. It is not easy for a patient to make a thoroughly satisfactory cold application unaided, except by an immersion-bath, since otherwise, at the best, only half the body can be bathed and rubbed at one time. The immersion-bath at low enough temperatures to be thoroughly stimulating is very refreshing to vigorous persons who are thoroughly habituated to it, but less safe for feeble persons. If the latter must take their bath unaided, rubbing with a large, dripping-wet towel is perhaps the best method.

(2) Hot baths, at temperatures considerably above that of the body, have primary effects similar to those exerted by cold baths, but secondary reactions are liable to occur, leaving the skin pale and cool and the arterial tone low, and, moreover, the skin is for a time after them abnormally sensitive to slight cold. It is risky, on these accounts, to take hot baths at bedtime, because the primary heat of the skin leads the patient to underestimate the amount of clothing which will be required later and he may wake to find himself chilled.

² As by the Betz canvas hood.

These dangers are diminished if sufficient time is taken to allow of complete cooling before going to bed, or if the hot bath is followed by a dashing or rubbing with cold water. Of course there are cases, however, where the sedative action of a prolonged warm bath is very useful. Massage given during warm baths is useful for elderly people with arterio-sclerosis — (Jacobi).

(3) It is a mistake to suppose that shivering is necessarily a sign that the body is becoming chilled to an objectionable degree. Shivering frequently occurs when one rises from bed on a cold morning, and yet wholly disappears, together with the *sense of coldness* that accompanies it, after a plunge into very cold water. Even blueness of the finger-tips is not necessarily a danger sign, since it is usually due to local changes in the cutaneous circulation, and not to weakness of the heart.

(4) Children do not require as low temperature as adults to develop such a degree of reaction as can be expected from them, and do not stand severe cold as well.

(5) Where the reaction on the part of the vasomotor system is to be limited to a small portion of the body, lower temperatures and more prolonged applications can be used than where the whole surface of the body is to be exposed.

(6) Where drip-sheets, or sheet-baths, or wet-packs are to be used, coarse linen sheets or damask table-cloths are better than cotton sheets, as being more absorbent and affording better surfaces for friction.

(7) The mechanical impact of a stream of water delivered under high pressure in the form of a douche adds greatly to the stimulant effect, and insures a better reaction. Nevertheless, a feeble patient has to be accustomed gradually to high pressures, as to low temperatures, and at first relatively short applications are necessary. In a well-appointed institution greater and readier variability, and thus better results, can be obtained than in a private house.

(8) Especial caution is necessary in applying baths, tending to produce much reaction, to elderly persons, or to any persons with brittle arteries or with disease of the heart.

ON RETRODISPLACEMENTS OF THE PREGNANT UTERUS.¹

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THESE remarks are based upon the following case: Nelly H., age twenty years, single, of thin girlish figure, was referred to me as having an ovarian tumor. Menstruation, previously regular, had been absent for fourteen weeks. The subjective symptoms of pregnancy were denied, and also, as is customary in girls of her class, its possibility. There had been much abdominal pain of late, and her bowels had not moved for several days. Urination was regular and painless, occurring perhaps six times in twenty-four hours. Some weeks previously, however, she had noticed some difficulty in urinating, but as at that time she was under treatment for a supposed gonorrhea (in reality the increased secretion of early pregnancy), the dysuria had been regarded as incidental to her disease. The abdomen was found to contain a smooth tender tumor reaching to the umbilicus; the external genitals

were deeply congested, with marked bulging of the perineum, and the uterus was found to be enlarged and completely retroverted. 1,920 cubic centimetres (65 ounces) of clear pale urine was withdrawn by catheter with much difficulty, but all attempts to replace the uterus were unsuccessful, and as the pelvis seemed already overfilled she was not packed but sent home to bed. The second day, after drawing off 2,110 cubic centimetres, taxis again failed, but on the third day I managed to replace the uterus. A pessary was worn for a month and she went to term in safety. On examining her two years later, I found the uterus in good position, and she told me that a doctor told her a few months after the child was born that the uterus was then in good position, but that upon her becoming pregnant a year later the displacement had returned and that she had had retention again.

While this case is commonplace and typical enough in most respects, it is to be noted that she was unconscious that there was retention, and that there was not the dribbling usually associated with retention, but a fairly regular evacuation of some 250 cubic centimetres at a time. This apparently was a retroversion of a pregnant uterus, and not a case of pregnancy in a retroverted uterus, a distinction which I think should be made when possible, for the latter offers a much better prognosis—if left to nature—than does the former, as in an accidental retroversion the force that drives the enlarged fundus past the promontory of the sacrum probably will be much greater than any force that nature can exert to replace it. A slight degree of backward displacement generally causes little trouble. Many of the more extreme displacements also correct themselves as pregnancy advances, generally during the fourth month, just as an ovarian tumor, normally prolapsed at first, swings up out of the pelvis as soon as with increase in size the force which impels it to expand in the line of least resistance becomes sufficient to overcome the force which holds it down. In a certain number of cases, however, spontaneous cure does not take place. In 24,000 gynecological cases Martin saw 121 incarcerations.

Spontaneous cure will be limited by four factors—adhesions, the sacral angle, the character of the displacement, and the degree of the displacement. Adhesions will not always soften up; it is evident that the more pronounced the sacral angle, the harder it will be for the uterus to get past the promontory; while as regards the character of the displacement it has been argued ingeniously by Chrobak that it makes a great difference whether we are dealing with a version or a flexion. In flexions the cervix lies in the pubes, against which it is pressed, a point of leverage when uterine contractions take place. Furthermore, in flexions the uterus is on the stretch at its upper convex surface, and accordingly the most vigorous contractions will take place there, the effect of which is that the fundus is being continually pulled up out of the sacral hollow, while at the same time contractions lessen the antero-posterior diameter of the flexed uterus, thereby giving it more room to swing up in, none of which things occur in a version. From this Chrobak reasons that unadherent flexions may be left to themselves, while all versions should be corrected at once. While the correctness of his theory must depend in doubtful cases on the angle of the cervix to the pubes, in versions of the third degree, at all events, in which the cervix may point almost directly upwards

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