Dubois (H. A.)

With Compliments of the Author.

ON THE

Treatment of Fever by Cold,

BY H. A. DUBOIS, M. D.,

OF SAN RAFAEL, CAL.

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Extracted from the Transactions of the Medical Society of the State of California, for the year 1876.

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SACRAMENTO:
SACRAMENTO LEADER PRINTING OFFICE.
1876.

ERRATA.

Page 1—1st line, for "willful" read "skillful."
Page 2—12 lines from bottom, after the word "indeed" insert "only." Same line, instead of "a useful" read "an useful."
Page 3—16th line, instead of "and as" read "and so."
Page 4—8th line, instead of "impossible" read "possible."
Page 4—27th line, instead of "mattrass" read "mattress."
Page 4—2d line from bottom instead of "long" read "large."
Page 5—3d line leave out the word "easily,"
Page 5—4th line from bottom, instead of "mattrass" read "mattress."
Page 5—1st line from bottom, instead of "mattrass" read "mattress."
Page 5—8th line from bottom, instead of "springs," read "holes."
Page 6—1st and 7th lines, instead of "mattrass," read "mattress."
Page 7—3d line, instead of "," read "."

ON THE TREATMENT OF FEVER BY COLD.

BY H. A. DUBOIS, M. D., OF SAN RAFAEL.

The tendency of modern medicine seems to be towards a willful use of the most simple remedies for the cure of disease. Elaborate prescriptions are going out of use, and we are content with those that contain one or two active ingredients. With the lessening of medication, greater attention has been paid to the natural course of uncomplicated disease, and to all those external agencies which influence both health and disease. Amongst the chief of these, are air and water. We have learned something of their use, and of the control that they have over diseased actions, but still we are only on the threshhold of a full knowledge of their properties. Heat and cold are becoming more familiar to us; the therapeutic use of electricity is yet in its infancy, while the study of motion in its application to the cure of disease is hardly entered upon. It requires no prophet to foretell that the use of drugs will become more and more limited, and that they will be prescribed with greater certainty as our knowledge of various physical agencies increase. In times past much research was wasted on the causes of disease when as yet there was not a sufficient body of facts collected to justify generalization. Then, too, treatment was often adopted on such incomplete aud faulty theories, which often led to the most disastrous results. Now we devote more time to the symptoms and immediate causes, and are exceedingly careful in carrying out a treatment based on ideas as to the ultimate cause of disease, unless experience gives proof of its usefulness. Amongst the symptoms common to a large class of diseases is an increase of heat, and we are no longer content to estimate

this by the *tactus eruditus*, but resort to the thermometer. It is but a few years since this instrument has been so perfected as to make it generally useful at the bedside. It is now a new sense which the physician carries in his pocket, ready to give him the most accurate information. By its use he frequently discovers fever where without it the hand would indicate an undue absence of heat. It enables him to watch a case with intelligence and gives him a power of fore-telling, which before he did not possess. Since the thermometer has come into use more general attention has been paid to fever as a symptom, and various plans have been resorted to for reducing the heat of the body in disease. Our knowledge of the laws governing fever have been enlarged, and we have discovered *that fever is often the direct cause of death through heart exhaustion, and that a patient with a high general temperature can be exposed to cold without danger*, he will not take cold so long as his temperature is much above that of health. To Hahnemann we owe a debt of gratitude for the effect that his fanciful doctrines have had in proving that disease is often self-limited, and that recovery will take place without internal medication. It is useless to deny that the diminution in the quantity of medicine used now, as compared with that used in his day is due partly at least to the influence of his doctrines. We have also to thank him for calling attention to the study of symptoms. To Priesznitz, who introduced the use of water as a sole means of cure, we are also under obligations for the effect that his ideas have had upon the general public, as well as upon the profession. With these few introductory remarks we will take up the immediate subject of this paper, viz: the treatment of fever by cold. It is only within a few years, indeed, since we have had a useful clinical thermometer that the use of cold bathing in fevers has been based on correct principles, and taken from the hands of the empiric to increase the resources of the physician. Before it was recommended by Niemeyer and others in certain diseases, but as we had no means of watching the effect with accuracy, and as in certain cases it resulted disastrously, it never gained the general confidence of the profession. No sooner had an instrument by which we could estimate accurately the heat of the body been made than experiments began to be tried, and now its use is almost general by the younger school of physicians in Germany, and is spreading rapidly through the rest of the world. In Ziemssen's Cyclopædia, now being translated from the German, will be found a number of articles illus-

trating the use of cold bathing in reducing the temperature in disease; particularly on its use in typhoid fever, by Liebermeister. The treatment consists in watching the temperature of the body by the thermometer and as often as it rises above F. 102°, in placing the patient, after the administration of a small quantity of stimulus, in a bath, ten or more degrees below the normal temperature, and in applying still colder water to the head, and in retaining him there until the temperature has come down nearly, or quite, to that of health. In practice, it is found that these baths take from ten minutes to three-quarters of an hour and that they require to be repeated eight, ten or more times in the twenty-four hours. That a nervous shock is produced at first, in some cases amounting to a decided chill, and that there is danger from this cause to the heart, without its action has been stimulated previously. After a bath the heat of the body slowly increases until the the temperature has again reached the point attained before (102°), when it has again by the same means to be reduced, and as the case progresses, with perhaps a daily large dose of quinine.

Now to mention nothing of the wear and tear of the body from the frequent movements in bathing, of the difficulties in commanding the necessary assistance in a large proportion of the cases in private practice in removing the patient to the bath, and back again to the bed; it seems unphilosophical to bring the temperature suddenly down, only to let it rise again, if there are any means by which it may be more gradually lowered and kept down, near to that of health. Cold sponging, the wet sheet, a draught of cold air, have been used after the temperature has once been reduced.

Is there no way by which the body can be cooled and kept cool, except by placing it in a tub of cold water? Any one who has traveled on the plains will remember how soon all animal heat can be abstracted by a wind, the temperature of which is comparatively high, but in swift motion. Air, then, in motion, ten to twelve degrees cooler than the body in health seems one of the most natural methods of taking away the excess of heat in disease. It appears to me that water in motion might also be employed with good results, especially locally. In reducing the unnatural heat of disease the chief danger from the employment of cold is nervous shock. No one can doubt that this excess of heat could be more safely removed by swift-running water at the temperature of the body in health than by still water at a temperature from 20° to 30° below it.

The same holds good in regard to air. The great danger of the treat-

ment, as we have said, consists in its immediate effect on the action of the heart, and we propose MOTION in the fluid at a little below the normal temperature of the body to overcome this objection.

The difficulty in the employment of cold bathing is chiefly confined to its use in private practice, and the same is true of the methods of removing the heat of the body by moving air or water. Thus far we have tried to prove that there is no necessity of a primary shock in lowering the temperature in disease, as it is impossible to employ a fluid only a few degrees below that of the patient in health, and if it be in motion we shall yet as certainly remove the surplus heat as if the body was bathed in water of a much lower temperature. We shall try now to show by what means it may be made available in the hospital and sick room. There seems to us little doubt but that in the not far distant future, fever wards in hospitals will be so constructed that air of a suitable temperature will be admitted with a definite degree of force, which can be so regulated as to carry off any desired amount of heat from the body. It certainly seems reasonable to apply the cold to the inside as well as to the surface of the body and this air will do, as it enters the lungs, and with cold drinks which will have a similar effect on the stomach, the temperature of the inside of the body can be gradually and safely lowered. Water we believe will also be used in motion, but to make use of either moving air or water in private practice presents many difficulties. In most cases we believe the simpler plan will be to cool and give motion to air by running water, and for this purpose we may use a variety of apparatus according to the amount of the heat we desire to abstract. Should this amount to little, we may simply place the patient on a mattrass of woven wire, or on one of steel springs lightly covered. If we desire to remove heat more rapidly, we may place under the first, or between the springs of the last, one or more tubes in which water a little lower than the normal temperature of the body circulates. Any person of ordinary ingenuity can easily direct the construction of a suitable apparatus. A garden hose run up and down a few times might answer in an emergency. If water is laid on, as it is now in almost all towns of any size, a connection can easily be made by a small rubber tube, and the waste water can as easily be gotten rid of by passing a similar tube through a window. In the country it may be necessary to have a barrel of water outside of the room, to which a tube can be connected. A thin French rubber tube three eighths of an inch in diameter, is amply long enough, and will be found far more portable, though a little more expensive than the

American hose. The tubes under the bed can easily be made of galvanized iron costing only ten to twelve cents a foot, and connections can easily be made by corking the ends and passing glass or metal tubes through, on which the small rubber tubing can be slipped; or a tinner in a few hours could make a set of tin tubes connected together at either end. The ordinary stop-cock used with basins where water is laid on, will answer to regulate the rapidity of the current. The principle being understood of causing water at or near the temperature of health, to circulate below a metal mattress only lightly covered, it is easy to devise the necessary contrivance to carry it out in any individual case. Should it be desirable to diminish the heat of a part as the lungs, bowels, etc, we may use besides the *Running Water Bed, the Running Water Quilt*, which is nothing more than fifteen or twenty feet of thin rubber tubing three eighths of an inch in diameter, quilted with a little wool or hair, between two pieces of muslin. It can be made to fit any part, and of any size—one eighteen inches wide by two feet long, and of an oval shape, will generally be found the most convenient. The same quilt if made to fit the head will answer instead of the *Running Water Pillow* to be described hereafter. Of course this quilt can be kept in any shape by wires, or supported by a cradle. With these three, it is believed that heat can be slowly and surely abstracted from the body, and all that a country practitioner would require, would be a dozen yards or so of light three eighth inch tubing; everything else he could have made on the spot, though doubtless a few connections and a small stop-cock or two, would be found convenient.

We propose to describe a Running Water Bed, the same in principle as those mentioned above, but which it is thought will be found more portable and convenient. A wire woven mattress is fitted on a three quarter camp bedstead, and underneath it at the distance of a few inches, is hung a shallow tank of wood, metal or rubber, and the bottom is interrupted in such a way that the water will be forced to zig zag down from the head to the foot of the bed. This tank is covered by two thin closely fitting covers pierced with springs, so that when one is moved on the other, the holes can be closed to any desired extent. Water is let in at the head and carried off from the foot.

If the tank is made of rubber it can readily be folded up. The bedstead is made to take apart, and the wire mattrass rolls up, so that everything can be made into a bundle six or eight inches in diameter by three or four feet in length.

The best covering to the wire mattrass it is believed, will be found to

be felt, pierced with holes—although a very thin hair or wool mattrass may be used. I have not mentioned the ordinary water bed of rubber, as it is expensive, difficult of movement, and easily worn out. The Running Water Pillow is a small rubber pillow, through which the water is forced to zig zag by partial partitions.

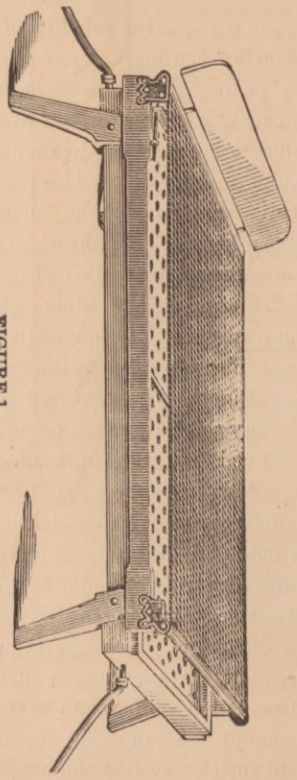

FIGURE 1.

Represents the Running Water Bed complete with the exception of felt pierced with holes, and which takes the place of the mattrass. The woven wire can be put on the stretch by means of a key near the head of the bed. Below is seen the double perforated cover, the upper section of which slides upon the lower lengthwise, so that the openings can be partly or completely closed. The head board takes off, and the feet fold up, so that the bed is portable.

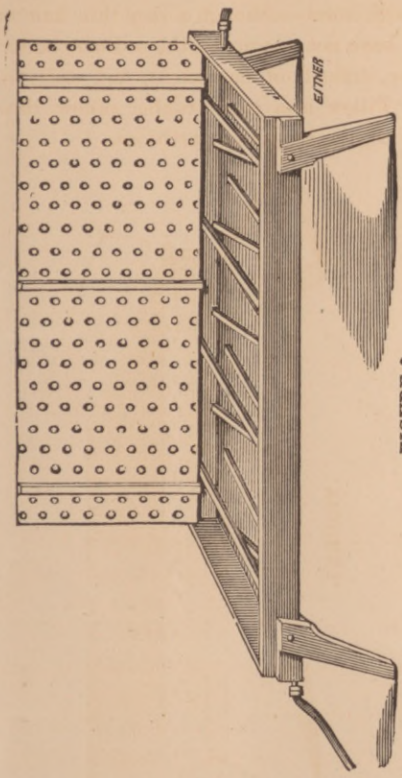

FIGURE 2.

Represents the double perforated cover lifted up so as to show the running water tank. Above this is seen four cross pieces for the cover to rest on, and about two inches high, The water is let on at the upper end of the bed and passes in a zigzag course to the lower end and is carried away by the waste pipe.

In conclusion I submit the method of reducing the heat of the body gradually, instead of suddenly, and by moving fluid instead of by a still one, to your consideration, and would ask for it a trial. If the principle is correct, doubtless other and more convenient apparatus can be contrived than those mentioned above.