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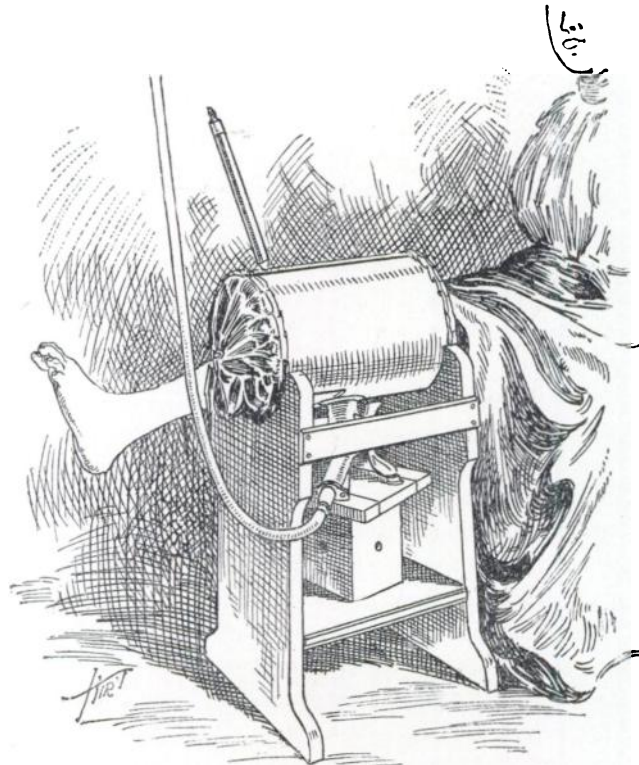
By WILLIAM E. WIRT, M.D.,
CLEVELAND.

LAST October I presented to the Mississippi Valley Medical Association an informal report of the use of dry heat of high temperature in the treatment of chronic joint affections. Notice was given of this informal report in several of the medical journals throughout the United States. As a result I received during the past year a number of letters asking me to direct the writer to a full report of my method of using the heat. These letters I answered in person, but as no full report had been made it required in each case that a complete description be made of my apparatus. That my article had attracted some little attention seemed to me reason enough for my presenting at this time a full description of the apparatus I am using.

Medical writings indicate that heat and cold have been used for many ages to allay inflammations. The effect of these agents is determined by their influence in modifying the circulation and the secretions, and in certain instances by the apparent influence on the nerve-supply to a part. Heat has been used of nearly every range of temperature from that of the blood to that of the white heat of the Paquelin cautery. The low temperatures are applied for prolonged periods, while the higher temperatures are used only momentarily. The method I am describing contemplates the prolonged use of a high temperature—say 250° to 300° F.—for a period of one-half hour to one and one-half hours. While the prolonged use of low temperatures and the momentary use of very high temperatures each modify the circulation, and the latter probably the nerve-sup-

ply, they neither of them markedly influence the secretions. On the other hand, the prolonged use of high temperatures enormously increase the secretions, while also influencing the blood- and nerve-supply.

Physics and physiology teach us that while the body can only bear a temperature of about 160° in a saturated atmosphere, yet, if the air is kept very dry, the body can endure a temperature of several hundred degrees F. for part or even a whole hour. To give exact data, it is stated that a man has endured for half an hour a temperature of over 600° F. in a drying-oven.



[The foot should have been placed on a chair of the proper height.]

The apparatus before you consists of a copper cylinder twelve inches long and nine inches in diameter. Fitting into each end of the cylinder is a wooden ring or disk, one inch wide by one inch

thick. The wooden rings are secured in the ends of the cylinder by eight short screws passing from the outside through the cylinder into the rings. At each end of the cylinder is a hood which encircles the limb, and is drawn tight by means of puckering strings. The hood is made of double-coated rubber cloth, and is attached to the cylinder by being nailed to the wooden rings, the extreme end of the hood being held in place by a wire band. On each side of the cylinder, diametrically opposed, are two (or three) holes three-eighths of an inch in diameter. The purpose of these holes is to allow a rapid change of air in the cylinder. In use I have felt the air come out of these holes with such force as to put out a lighted match. The cylinder is supported horizontally in a wooden frame, so that the lower surface of the cylinder is eighteen inches from the floor, or about the height of an average chair.

I have applied heat by means of oil lamps, gasoline lamps, alcohol lamps, the gas-jet, and the mixed gas and air jet, which is the Bunsen burner; the latter is probably the most convenient. The heat should not be turned on too rapidly at first, as the patient's endurance is greater if the heat is applied gradually. In using this method for the knee I apply a layer of cotton to the back of the limb in the popliteal region, securing it in place by loosely tied tapes. This is done for two reasons: in the first place, it will equalize the temperature, as undoubtedly the lower part of the cylinder is much hotter than the upper; and, secondly, I found that the profuse perspiration, resulting from the high temperature, caused a dropping of fluid to the bottom of the cylinder, where it was instantly turned into steam, and this steam would immediately scald the limb. The limb being thus protected by the cotton is inserted into the cylinder until the knee is in the centre, the heel placed on a chair high enough to keep the calf from touching, if possible, even the wooden rings, which, though they do not burn, yet they may get uncomfortably warm. The hoods are drawn tightly around the limb, and at the start rubber corks are inserted in the holes in the cylinder, but are withdrawn when the cylinder is thoroughly heated. The heat is then applied to the cylinder and is carried up to the limit of endurance of the patient, which varies from 250° to 300°, and is kept at this point for an hour or more. One patient of mine could stand a temperature of 290° for over an hour. The effect of such a high tempera-

ture is to enormously increase the perspiration from the local part, to increase perspiration over the whole body, to increase the amount of blood to the part or at least the surface-circulation, to relieve pain, and to increase mobility in the joint. The relief of pain and the increased mobility last for some hours after the application of the heat. I have used this apparatus in cases of simple rheumatism, rheumatoid arthritis, gonorrhœal rheumatism, and simple synovitis following a dislocated patella which had become somewhat chronic.

We all realize how difficult it is to give relief in such conditions as rheumatoid arthritis and gonorrhœal rheumatism. Yet I have had patients suffering from these conditions claim that the pain was relieved as soon as a considerable heat was attained, and that the mobility and pain were both benefited for some hours. Anything that will give relief to these patients will be hailed with delight by the profession at large, and especially by those suffering from these affections.

DISCUSSION.

DR. RIDLON asked how this differed from the English apparatus used by Mr. Hasham in the treatment of flat-foot, described in the last volume of the TRANSACTIONS. He had been unable to learn from the circulars descriptive of this apparatus how the air was kept dry.

DR. WIRT said that he had been using his apparatus for two years, and he too had been unable to understand the description given of the English apparatus. In his own the air was kept dry by proper ventilation.

DR. GILLETTE said that he had used this apparatus, and had been much surprised at the amount of heat the patient could stand and the quantity of perspiration induced. He could not speak as yet regarding the results of this treatment.

DR. KETCH said that they had in the New York Orthopedic Dispensary an apparatus for producing what is called "hydraulic mas-

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sage." It was useful in old cases of rheumatism and rheumatoid arthritis and stiffness following sprains. The water is pumped into the apparatus, and passes into a cylinder in a series of jets. It was interesting, he thought, in connection with the apparatus just described.

DR. WIRT said that the trouble with the hot water was that the temperature could not be carried very high, and hence not much effect could be obtained on the secretions.