and I would like to explain why the room is warmer when the humidity is high than when it is low.

The case of a man taking a bath will illustrate the point. Let us suppose that the temperature of his body, the water in the tub, and the air in the room are the same, and that the humidity is very low. When he gets out of the bath his body is covered with moisture which evaporates. This evaporation requires heat which is drawn from his body and results in the sensation of cold. If, on the other hand, the humidity in the room had been 100%, the air would not have been capable of absorbing more moisture, then there would have been no evaporation from his skin and he would not have felt at all chilly, hence there is a feeling of greater warmth when the humidity is high than when it is low, although the temperature of the room remains the same.

Steam engineers will readily recognize a similar phenomenon taking place in a steam boiler. After the water is heated to the steaming point it requires an addition of a great deal more heat to cause it to burst into steam. This is termed the latent heat of evaporation. In the same way latent heat of evaporation is required in evaporating water from the body at atmospheric temperature and this heat must come from somewhere, which in this case is supplied by the human body.

It would not be desirable to maintain the humidity of a room at 100% since the body depends on a certain amount of evaporation to throw off impurities, and this action would not take place, hence a desired humidity of from 40 to 65%, which amount really depends on the physical characteristic of the person who is occupying the room.

Regarding another point that was brought up as to whether it would not be a saving of heat by maintaining a higher humidity; theoretically, yes, but as the process of humidifying the atmosphere now in vogue also includes a system of ventilation no separate tests have been made to my knowledge. The process of humidifying is generally accomplished with the fan system of distributing air for heating ventilation and humidifying. As the ventilation frequently changes the air you will, of course, require more heat than by direct radiation in a closed room. The air is first brought over tempering coils and assuming the air out of doors to be at a temperature of 20 degrees, and 100% humidity, and when this is heated to 40 degrees, by these coils and humidity would then be, say, 50%, because, as air is heated its capacity for moisture or humidity is increased. The air is then passed between baffle plates over which water is trickling and becomes saturated, that is, has a humidity of 100%. This air then passes through the fans and is blown over the heating coils which raises its temperature to say 65 degrees, and the humidity would then drop to about 45%.