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## CLIMATE IN RELATION TO HEALTH.\*

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Mr. Chairman and Ladies and Gentlemen:—

In order to comprehend the problem of climate in relation to health, we must for a moment consider the relation of the atmosphere to the human body. Herbert Spencer has defined life "as the concordance of a series of internal movements in correspondence with a series of external acts;" or, as the Spanish poet-scientist would put it, . . . "Life is the harmonic rhythm of the infinitude of individual cell-organisms of the body in consonance with the Mechanism of the Universe (*Mechanica ritmica*)."

Briefly stated, the oxygen of the air is *life* and upon its entrance into the system depends the functioning of the tissues and organs of the body. We respire 17 times in a minute normally, and inhale some 25 cubic inches at each inspiration, or in twenty-four hours some 11 metres of air, of which one-fifth is oxygen. In health this air enters by way of the nose, but in increased exercise by the mouth as well. It is evident, therefore, that normal inspiration depends upon healthy air passages; without them the chest becomes depressed and finally deformed. Mouth-breathing is abnormal and injurious since the air reaches the lungs too soon to be warmed, while in addition, its impurities reach the mucous membrane directly instead of being filtered by the cilia of the nose. Indeed, physicians are now agreed that it is by the mouth that infections most commonly reach the system through the tonsils; while on the other hand, the air entering by the nostrils is filtered, warmed and moistened before reaching the delicate lung tissues. Assuming that this air is dry and cold, we find that it takes up in the air passages moisture to 92% of saturation, and is raised to 97° F. before being expired. The water thus abstracted from the body amounts to 7,000 grains, or 1 pound, in twenty-four hours. Moreover, Miquel has shown that air has as high as 70 living germs even in pure outer air per metre, and as many as 20,000 in the air of hospitals and other crowded buildings. Assume that the air inspired is in an impure, infected house atmosphere and we cannot fail to

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