

# **HEALTHY RESPIRATION**

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Healthy respiration by Stephen H. Ward

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**STEPHEN H. WARD**

**HEALTHY  
RESPIRATION**



# HEALTHY RESPIRATION.



BY

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MDCCCLV.

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## P R E F A C E.

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THE Public cannot be expected to interest themselves in carrying out either general or special sanitary indications, so long as they remain ignorant of the principles upon which such indications are based. Intelligent conviction must precede energetic action. Such is the plea which the Author advances for the publication of the following Lectures, which were delivered last winter before a considerable London audience. Most of the facts and views contained in them may be met with in the leading works upon Hygiène; but these are either beyond the reach of the many, or, of so extensive a character, that much time and application would be necessary in order to master their contents. For the treatment of the subject the Author is responsible; and he trusts that he has expressed himself with sufficient emphasis, to induce others to throw themselves more trustingly into that broad physical relationship with external nature which it was the purpose of the Creator to establish.

28 Finsbury Circus.  
August, 1855.

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# HEALTHY RESPIRATION.

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## LECTURE I.

RESPIRATION, or the act of breathing, considered in its relation to health, involves not merely an inquiry into the function itself, into the composition of the air we breathe and the mechanism by which we breathe, the changes induced in the blood and in the atmosphere, and the power by which respiration is effected and maintained, but has also a far wider scope, and embraces the various actions and conditions of life which may influence and be themselves influenced by the healthy or unhealthy performance of the function. The philosophy of dress, cleanliness, exercise, and, to a certain degree, of food, the various causes by which the purity of the atmosphere either within or without our dwellings may be impaired, the principle of ventilation, several of the more important questions bearing upon public hygiene, the influence

upon epidemics of atmospheric conditions which are within our control, the importance of change of air, and, lastly, the means by which Providence maintains the purity of the atmosphere for the life of animals and man, fall legitimately within the comprehensive scope of the subject. Respiration, therefore, largely viewed, embraces problems immediately affecting our health and comfort; and its consideration derives additional importance from the fact that one-fifth, at least, of the mortality of this country is to be traced to diseases of the respiratory organs.

In the present lecture, I shall endeavour to explain clearly and fully the means by which respiration is performed, and its purposes, and subsequently shall consider the causes which promote or interfere with its effective mechanism and chemistry.

Breathing consists in a constantly sustained succession of movements, by which air is alternately taken in, and driven out through the mouth, throat and air-tubes from the lungs, in the cells of which it is brought into contact with the blood. It has for its object the removal, in the form of gas or vapour, of noxious materials from the body, and the purification of the blood; animating this fluid and the new food contained in it with the breath of life, and fitting it for the

nourishment of the body and the effective performance of various functions. For the attainment of this object, it is necessary that the blood should be brought into immediate contact with the atmosphere. This is effected in different classes of animals by an extension of surface in the form of a delicate membrane, beneath which the blood flows in countless hair-like vessels, and through which the necessary changes transpire. Such, throughout the animal kingdom, is the principle of the respiratory apparatus, whether it be exhibited in the form of hair-like appendages, tufts, feathers, gills, and so on, as in aquatic animals, or of tubes, sacs, and cavities, as in different terrestrial animals.

I might pleasingly engage your attention by taking in review the modification of simple means, which under Creative power has resulted in an infinite variety of forms adapted to a special purpose, and at the same time throw light upon my subject by showing the close connexion which subsists between the habits and activity of animals, and the energy with which their respiratory function is discharged. Referring you, however, to the comparative anatomist for instruction in these matters, I pass on to the consideration of the function as it exhibits itself in man.

The lungs, in man, are light, spongy structures