

ious and other refuse matters owing to neglect or the want of proper drainage. The air in its ordinary state consists of two principal gases, namely, oxygen and nitrogen, about twenty-one volumes of the former and seventy-nine of the latter, in addition to small quantities of carbonic acid. Either oxygen or nitrogen in a separate state or combined in any other proportions would prove destructive or injurious to life but in the atmosphere. They are blended together in such proportions that the destructive properties of each are neutralized.

The function of respiration comprises the twofold process of inspiration and expiration. At each inspiration made by the animal a considerable quantity of air passes into the lungs, and, having penetrated to the remotest parts of the bronchial tubes, enters the air cells, thence through the capillary vessels into the blood, which has been rendered impure in its circulation through the system. A peculiar change here takes place between the air and the blood. The oxygen of the air combines with the blood, and, uniting with the carbon contained in it which renders it impure, forms carbonic acid, thus rendering it again fit to pass on and supply the wants of the system. The carbonic acid and nitrogen (both in their present state destructive poisons) are expelled from the lungs by the process of expiration into the surrounding atmosphere. The effect of several horses being shut up in the same unventilated stable is to completely empoison the air, yet even in the present day, particularly in agricultural districts, there are too many who carefully close every aperture by which a breath of fresh air can gain admission. The result is, with the breathing of every animal the contaminated air passes again and again through the lungs. The blood cannot undergo its proper and healthy change, digestion will not be so perfectly performed, the nervous system will suffer, and all the functions of life be more or less impaired. and, under such conditions, one need not be surprised at finding sore throat, inflamed lungs, diseased eyes, etc., making their appearance.

Another source of impurity to the air in stables is the presence of deleterious gases resulting from the decomposition of the excretion of the animal and vegetable substances. The principal gases involved are the compounds of sulphur and carbon with hydrogen and ammonia, all more or less injurious to the health. When a person just enters an ill-ventilated stable in the morning he is annoyed not only by the heat of the confined air, but by a pungent smell resembling hartshorn. The urine contains exceedingly large quantities of compounds easily converted by decomposition into ammonia. Influenced by the heat of a crowded stable and possibly by other decompositions that are

going forward at the same time this ammoniacal vapor begins to be given out rapidly almost immediately after the urine is voided. When disease makes its appearance in these badly ventilated stables, is it strange that it spreads with alarming rapidity? When influenza appears in the spring time or in the fall, it is in very many cases due to this cause. The horses of a small establishment rationally treated have it comparatively seldom or have it slightly, but in crowded stables it is sure to prove itself most fatal. The experience of every veterinary surgeon and every large proprietor of horses will corroborate this statement.

Of nothing are we more certain than that the majority of maladies of the horse, and those of the worst and most fatal character, are directly or indirectly to be attributed to a deficient supply of air, cruel exaction of work, and insufficient or bad fare. While the stables of the cavalry forces of Great Britain had poor ventilation the fatalities of disease were enormous, but after the sanitary conditions were improved, diseases which formerly affected whole troops almost entirely disappeared. The poisonous effects of carbon monoxide, which is the gas used for lighting purposes, are well known. It is a common occurrence for whole families to be prostrated from its effects. It has a great affinity for the blood, and displaces the oxygen, death being the result. In like manner the other gases previously mentioned, although perhaps not so poisonous, have a serious effect on the blood. They have a tendency to displace the essential elements of aspiration and life, causing pathological change in the system.

The temperature of the stable is also another important factor. This should seldom exceed 70 or 75 degrees in summer or below forty in winter. The hot stable is thought by some attendants of horses to produce a glossy coat. In winter a thin glossy coat is not desirable. Nature gives to every animal warmer clothing when the cold weather approaches. Horses used for agricultural purposes especially require a thicker coat in order to protect them from the surrounding cold, just as human beings put on additional and warmer clothing, and their comfort is increased and health preserved by it. Warm clothing, even in a cool stable, with good attendance, will keep the hair sufficiently smooth to satisfy the most fastidious. The over heated stable saves much grooming, but at the same time sacrifices the health of the animal. The horse stands, say from twelve to twenty-four hours, and sometimes even longer than this, in this unnatural vapor, and then he is stripped of his clothing and led into the open air, where he is kept sometimes for hours in a temperature of fifteen or twenty degrees or more below that in the stable. Putting the inhumanity of this out of the question,

must not the animal thus unnaturally treated be subjected to rheumatic and catarrhal affections? The return to a hot stable is quite as dangerous as the change from a heated atmosphere to a cold air. This is frequently seen where horses are left out late on pasture in the fall of the year, then taken and confined in close stables, and as a result some disease is contracted likely to be febrile in character. The sudden change of temperature, whether from heat or cold, or *vice versa*, yearly destroys thousands of horses. The stable should be large in proportion to the number of horses it is destined to contain. Box-stalls are preferable to the ordinary open stall, inasmuch as they allow considerable space for the animal to move around and exercise, and lie and rest after a hard day's work. Boxes are also necessary for sick horses, and especially when suffering from any contagious disease. Each box should be about fifteen feet long by ten feet wide, with side walls nine or ten feet high; a pipe should run through to the roof, or else connect with one that does go to the roof of the building, to allow gases generated to escape. This is especially necessary where horses are kept in back stables. Ventilators should also be put in the wall at as high a point as possible from the floor, so as to allow the air to pass in above the animal. There are different modes of arranging ventilators, and any plan will do so long as the animal is not exposed to draughts.

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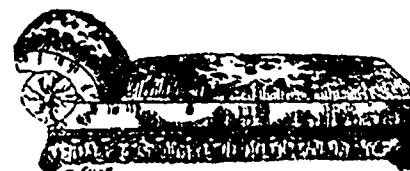
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