2. That the mortality from phthisis amongst the English soldiers in the West Indies is small, and one-fourth less amongst Europeans than black or colored people.

3. It has not been proved that pulmonary consumption is frequent in Martinique, Senegal, Cayenne, or Italy; on the contrary, the imperfect statistics which we possess seem to show the contrary.

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On the Special Function of the Skin. By ROBERT WILLIS, M.D.

The purpose which is answered in the animal economy by the cutaneous exhalation has not, hitherto, been correctly assigned by physiologists. The author believes the essence of the function to be the elimination from the system of a certain quantity of water, and considers the saline and other ingredients which pass off by the skin to be too inconsiderable in quantity to deserve being taken into account. He combats the prevailing opinion, that this function is specially designed to reduce or to regulate the animal temperature. It has been clearly shown by the experiments of Delaroche and Berger that the power which animals may possess of resisting the effects of a surrounding medium of high temperature is far inferior to that which has been commonly ascribed to them; for in chambers heated to 120° or 130° Fah., the temperature of animals is soon raised 11° and even 16° Fah. above what it had been previously, and death speedily ensues. The diminution or even total suppression of the cutaneous exhalation, on the other hand, is by no means necessarily followed by a rise in the temperature of the body. In general dropsies, which are attended with a remarkable diminution of this secretion, an icy coldness usually pervades both the body and the limbs. A great fall in the animal temperature was likewise found by Fourcault, Becquerel, and Breschet to be the effect of covering the body with a varnish impervious to perspiration; and so serious was the general disturbance of the functions in these circumstances that death usually ensued in the course of three or four hours.

The question will next arise, how does it happen that health, and even life, can be so immediately dependent as we find them to be on the elimination of a quantity of water to the extent of about thirty-three ounces from the general surface of the body in the course of the twenty-four hours? To this the author answers, that such elimination is important as securing the conditions which are necessary for the endosmotic transference between arteries and veins of the fluids that minister to nutrition and vital endowment. It is admitted by physiologists that the blood, while still contained within its conducting channels, is inert with reference to the body, no particle of which it can either nourish or vivify until that portion of it which has been denominated the *plasma* has transuded from the vessels and arrived in immediate contact with the particle that is to be nourished and vivified; but no physiologist has yet pointed out the efficient cause of the tendencies of the plasma—first, to transude through the walls of its efferent vessels; and secondly, to find its way back again into the afferent conduits. The explanation

given by the author is, that in consequence of the out-going current of blood which circulates over the entire superficies of the body perpetually losing a quantity of water by the action of the sudoriparous glands, the blood in the returning channels has thereby become more dense or inspissated, and is brought into the condition requisite for absorbing, by endosmosis, the fluid that is perpetually exuding from the arteries kept constantly on the stretch by the injecting force of the heart. Venous blood has, in fact, by repeated experiment, been found to be somewhat more dense than arterial blood, which being assumed to have a mean density of 1,050, venous blood may be taken as possessing a mean density of 1,053.

In an appendix to the paper, the author points out a few of the practical applications of which the above-mentioned theory is susceptible. Interference with the function of the skin, and principally through the agency of cold, he observes, is the admitted cause of the greater number of acute diseases to which mankind, in the temperate regions of the globe, are subject. He who is said to have suffered a chill has, in fact, suffered a derangement or suppression of the secreting action of his skin; a process altogether indispensable to the continuance of life has been implicated, and disturbance of the general health follows as a necessary consequence. Animals exposed to the continued action of a hot dry atmosphere die from exhaustion; but when subjected to the effects of a moist atmosphere of a temperature not higher than their own, they perish by the same cause, and that very speedily, as those which have had their body covered with an impervious glaze; in both cases, the conditions required for the access of oxidised and the removal of deoxidised plasma are wanting, and life necessarily ceases. The atmosphere of unhealthy tropical climates differs but little from a vapor-bath at a temperature of between 80° and 90° Fah.; and the dew point in those countries, the western coast of Africa for example, never ranges lower than three or four degrees; nay, is sometimes only a single degree below the temperature of the air. Placed in an atmosphere so nearly saturated with water, and of such a temperature, man is on the verge of conditions that are even incompatible with his existence; exposure to fatigue or to the burning sun, by which the activity of the skin is excited whilst the product of its action cannot be taken up by the air, is then necessarily followed by disease, which experience has shown to be of the most formidable nature. The terms *miasma* and *malaria* may, according to the author, be regarded as synonymous with air at the temperature of from 75° to 85° Fah., and nearly saturated with moisture.

What is the cause of the rapidly fatal event in the most acute forms of scarlatina? The dead body of the victim of this disease gives us no information. The patient has undoubtedly been placed by the nature of his disease in precisely the same circumstances as he would have been had his body been completely covered by an impervious glaze; the function of his skin is abolished, and unless this be speedily restored he will be lost. The remedy then is not to be sought in wine and brandy, but in tartar emetic.—*From Proceedings of the Royal Society, March 2nd and 9th.*