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LEAD DISEASES:

A

TREATISE

FROM THE FRENCH OF

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L. TANQUEREL DES PLANCHES,

WITH

NOTES AND ADDITIONS

ON THE USE OF

LEAD PIPE AND ITS SUBSTITUTES.

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open air in summer, and in winter the room should be freely and constantly ventilated.

To render the scraping off as little dangerous as possible, it would be well to moisten the paint to be removed, and this should also be practised in the rubbing down with pumice stone, &c. If the pumicing be done dry, all the general means indicated to prevent breathing the lead dust should be used; and especial cleanliness, personal and general, should be the rule, particularly of washing before meals.

Substitution of Zinc for Lead in Oil Colors.

Numerous experiments have been made in France and England, to render painting healthy, by substituting for carbonate of lead, the base of nearly all oil paints, a substance whose action has no dangerous effect upon the system.

Guyton de Morveau first conceived the idea in 1781 of replacing white lead by white zinc. (*Annales des Arts et Manufactures*, an. ix. t. iv.) Parkes, and Turner, in memoirs published in England at nearly the same time, have also recommended the substitution of carbonate or oxide of zinc for lead in painting.

Vincent de Monpetit has also addressed a memorial to the Academy of Architecture, with the hope of making that adopt positively this substitution. The Academy by a committee, composed of Manduit, Bossut, Cherpitel and Antoine, adopted the ideas of Vincent. (*Ann. d'Hyg. et de Méd. lég.* t. xv.) The following are the reasons, deduced from numerous experiments repeated in different countries, and at different times, for the substitution of zinc for lead in painting:

1. Every body knows the pernicious effects of oil painting, with a base of carbonate of lead, upon the workmen who apply it; also upon those who dwell in close places where this paint is newly used. Oil paint mixed with carbonate or white of zinc, has no deleterious influence upon the workmen, or upon the inhabitants of the newly painted apartments.

2. Zinc white has a great advantage over white lead. The first of these substances is unchangeable, even by the vapors of sulphuretted hydrogen, and its different combinations, which immediately blackens all white lead paint. Zinc white mixes perfectly with all colors; it is employed alike in oil and distemper. It has been remarked, that it had the advantage of taking less oil, but that it dried less rapidly than white of lead.

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If zinc white has not as brilliant a whiteness as the white of lead, on the other hand, it preserves its color a longer time than this last. Indeed, the most beautiful white of lead, is liable to be reduced to a black color by contact with any thing containing the inflammable principle.

3. Zinc white costs less than white lead. Thus, besides the reasons for their health, house painters have another great advantage in substituting zinc white for white lead.

There are numerous mines of zinc; of late years especially, the extraction of this metal has been conducted on a great scale, for the use of the arts. Zinc white is prepared in great quantities in Germany. The following method is due to Hermann; it has been inserted in the scientific journals since 1826.

Zinc, or its oxide, is treated by sulphuric acid; the solution is afterwards treated by sulphuretted hydrogen, then by hydrochlorate of lime; finally it is concentrated, to separate the sulphate of lime formed; the hydrochlorate of zinc which remains, is precipitated by the subcarbonate of soda of commerce, the precipitated carbonate of zinc is washed and dried.

• Another more simple method is followed in England in different manufactories; it consists in precipitating a solution of sulphate of zinc (white vitriol) by carbonated alkali; but, as the white vitriol of commerce is impure, it is necessary to boil the solution, before precipitating it, in a vessel of copper, with zinc feathered or reduced to grains and scraps; this decomposes the metallic salts that the zinc may contain, and which would change its color, such as the sulphates of iron and of copper, of which white vitriol generally contains a certain quantity.

All the preceding assertions and experiments have been repeated and confirmed several times, under the inspection of the Royal Academy of Architecture at Paris, and the Academy of Dijon. The authentic approbation of these two celebrated societies, composed of learned persons, most capable of judging of such a matter, should excite the confidence of house painters and the public, in favor of this new white, which can have no injurious action on the health.

Tanquerel earnestly hopes, that the master painters and workmen will decide to substitute zinc white for white lead; they will then be able to work all their lives, without every moment fearing that they are injuring themselves, and they will find economy in this substitute, without in any way marring the beauty and durability of their work.

It is not astonishing, that this substitution has not been made already in painting, though it was proposed for the first time in 1781; for house painters were ignorant of the labors of the philanthropists, who had made these beautiful discoveries for rendering their occupation healthy. These discoveries, forgotten and registered with other very significant memoirs in the annals of science, have not come to the knowledge of the mass of the people. This is no longer an excuse, but it will, of course, take much time for this substitution to become general. But is it not the fate of most valuable discoveries, which have benefitted the human race, to wait a long time before men place confidence in them? But time at length sanctions what is good, conquers prejudices and interests, by opening new ways for the general good. If one did not wish to substitute zinc white for white lead in all cases, let it be tried as an experiment, to mix the first of these substances in the oil preparation, and use it, 1st, to paint the closets where hydro-sulphuric baths are administered; 2d, the seats of privies, in short, in all the places where there is a greater or less prevalence of sulphuretted hydrogen, or hydro-sulphates, which occasion the blackish gray discoloration of the paint in which white lead is mixed.

Painters of Decorations, Letters, &c.

The precautions just recommended to house painters, as a protection from lead diseases, are equally beneficial to painters of carriages and ornamental painters.

Drink adulterated with Lead Preparations.

Water Cisterns.—In some cities of Europe, as Amsterdam, the cistern water which is used is collected in reservoirs lined with lead. Serious diseases, which have supervened from the use of this water, which finally dissolves a small quantity of the lead transformed into oxide or carbonate, ought to induce the substitution of zinc for lead to line these cisterns. Then these grave diseases would not occur, for numerous experiments have lately proved the innocuous effects of zinc on the human system. (Parent du Châtelet, *Ann. d'Hyg. et de Méd. lég.*)

In some countries, lead is used to cover the roofs. Rain water dissolves some of the oxide of lead formed on the surface of the metal, and carries it into the cisterns where it is kept. From

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