

White lead workers : being an examination of the recent parliamentary papers. Showing that the proposed legislation cannot remedy the state of affairs under the old stack process, and calling attention to the true remedy. / by "Observer".

Contributors

London School of Hygiene & Tropical Medicine Library & Archives Service
London School of Hygiene and Tropical Medicine

Publication/Creation

London : Hamilton, Adams & Co., 1883.

Persistent URL

<https://wellcomecollection.org/works/ak932rw6>

Provider

London School of Hygiene and Tropical Medicine

License and attribution

This material has been provided by This material has been provided by London School of Hygiene & Tropical Medicine Library & Archives Service. The original may be consulted at London School of Hygiene & Tropical Medicine Library & Archives Service. where the originals may be consulted. This work has been identified as being free of known restrictions under copyright law, including all related and neighbouring rights and is being made available under the Creative Commons, Public Domain Mark.

You can copy, modify, distribute and perform the work, even for commercial purposes, without asking permission.

**wellcome
collection**

Wellcome Collection
183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
<https://wellcomecollection.org>

GJ

P. 7347

WHITE LEAD WORKERS:

Sm. 800

BEING AN

EXAMINATION OF THE RECENT PARLIAMENTARY PAPERS:

SHOWING THAT THE PROPOSED LEGISLATION CANNOT REMEDY

THE STATE OF AFFAIRS UNDER THE OLD

STACK PROCESS,

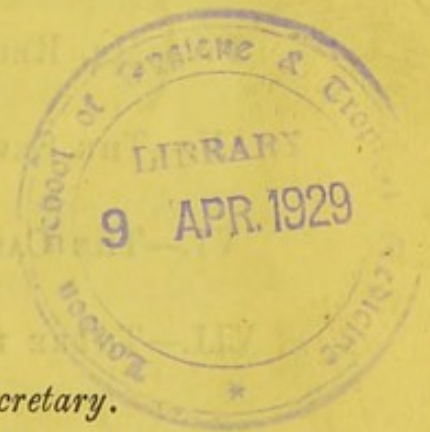
AND CALLING ATTENTION TO

THE TRUE REMEDY.

BY

“OBSERVER.”

Addressed to SIR W. HARCOURT, *Home Secretary.*



LONDON:

HAMILTON, ADAMS & CO., PATERNOSTER ROW.

—
1883.
—

PRICE THREEPENCE.

CONTENTS.

	PAGE
I.—INTRODUCTORY	3
II.—THE “OLD TIME” STACK... ..	5
III.—WHAT THE GUARDIANS SAY	9
IV.—MR. REDGRAVE ON THE SITUATION	16
V.—THE SEVEN WITNESSES	21
VI.—THE CASE OF “NO. 1”	25
VII.—THERE IS A REMEDY... ..	29

WHITE LEAD WORKERS.

I.—INTRODUCTORY.

“ The careful inquiry I have made has shown me that the temporary illnesses and permanent disabilities, which affect those working in white lead, far exceed anything that has come before the public.”

Such are the striking words of the man of all others competent to give an opinion on the matter, Mr. Alexander Redgrave, C.B., Inspector of Factories, in his report to the Home Secretary, “ presented to both Houses of Parliament by command of Her Majesty,” and recently published. He then adds, “ Occasionally there is a somewhat sudden death; an inquest is held, and public opinion, attention, and sympathy are roused, but the excitement soon passes away, and but little permanent effect has resulted from publicity.”

Coincident with the publication of this statement, the following appeared in the *Evening News* of March 31st:—

“ It is a good many years now since public attention was first drawn to the terribly dangerous nature of the white lead worker’s occupation, concerning which there are some startling facts to be found in a Parliamentary Paper issued to-day. Kind-hearted people were shocked by the nature of the revelations laid before them, and it was generally understood that the result of the outcry on the subject was the adoption of such precautions as reduced to a minimum the risk incurred by the operatives. Two separate inquests held yesterday by the coroners for East Middlesex seem, however, to indicate that there is still a culpable lack of care in the manufacture of the substance in question. Both victims were young women, and in each case the cause of death was unmistakably lead poisoning. In neither instance do the jury appear to have considered it necessary to couple their verdict with any caution or recommendation to employers or employed, but some such rider

would not have been out of place. The lead-worker's only chance of safety lies in absolute cleanliness of person and clothing, and proprietors of factories are bound to provide the means of securing that end. Like other persons employed in perilous vocations, however, the operatives become reckless from custom, and will evade regulations wherever possible. It is to be hoped that the details elicited at yesterday's inquest will act as a warning."

Followed on April 4th in same paper by—

" DEATH FROM LEAD-POISONING AT POPLAR.

" This morning Sir John Humphreys held an inquest at Poplar, on the body of Lydia Laydon, aged 13 weeks. Ann Piper, 21, Railway Street, Poplar, stated that the deceased was her niece. On Thursday last witness found the child dead in bed. She at once called for assistance, and sent for a doctor, who came and pronounced life extinct. The mother of the deceased was a lead-worker, and died from lead-poisoning on Sunday week. Dr. Andrew Macgill, Bromley, stated that he was called to see the deceased on Thursday. There were no external marks of violence on the body, and he had since made a post-mortem examination. On the lungs were black patches, and also similar signs on the stomach. The body was much emaciated. The cause of death was lead-poisoning.—The jury returned a verdict in accordance with the medical evidence."

Leading articles in the *Times*, April 17th, and *Daily Telegraph*, April 12th, of considerable length, written with vigour and clearness; the latter referring to a previous descriptive article by their able contributor, "One of the Crowd," together with the present and former Reports of Government Inspectors, besides numerous newspaper extracts, medical references, and the well-known description by the late Charles Dickens, are before us; and yet we are told, in well-weighed language, by Mr. Redgrave, *first*, that "the temporary illnesses and permanent disabilities which affect those working in white lead exceed anything that has come before the public." This, alas! we have evidence on all sides to prove, and, much as we might wish it otherwise, perhaps we even know more than enough; but, as to the *second* statement, shall we be content to let such a charge remain—"that occasionally there is

a somewhat sudden death, an inquest is held, and public opinion, attention, and sympathy are roused, but the excitement soon passes away, and but little permanent effect has resulted from publicity"? Shall the public attention and sympathy be but a *passing excitement*? And shall there be but "little permanent effect" from three inquests in space of a few days, the last of strange and sad character—a poor child of thirteen weeks old, the lead-poisoned offspring of a lead-poisoned woman, following her unhappy mother in a few days to the grave, concerning which there was but the one redeeming point, that it saved from the life of pain and misery which white lead poisoning entails? It is to stir up yet more abiding interest that some further important considerations are here placed before the public, who, perhaps, might desire fuller information on the matter, and have their opinions formed thereby.

Most necessary is it at the present juncture that public interest and legislations should not attempt that which is impossible, and, because of the certain failure, give up the case of the white lead worker as only open to a slight improvement through the most careful and stringent legislation. The writer believes, and will seek to show, that the attempt to improve the condition of workers in white lead, when carrying out the old "stack" process, must meet with but partial success, and poor women will still be found thronging the hospitals and workhouses, and bringing themselves and their offspring, if not to death, at least to disease and pauperism. He is, however, encouraged by the belief that a complete remedy has lately come into existence, namely, the "Gardner Process," by which—in less days than the number of weeks employed in the process at present used, and at less cost—there is produced the most superior white-lead, with *complete* immunity to those employed, and the necessity for female labour is altogether removed, while the washing and drying in stoves, as at present, is also done away with. He earnestly hopes both the Legislature and public will weigh the following pages carefully.

II.—THE "OLD TIME" STACK.

We will first look at the "stack" process as at present carried on, as described in the *Newcastle Daily Chronicle* of May 20th, 1882—

"The processes gone through in the manufacture of white lead

may be briefly described. The melted metal is lifted in ladles from a cauldron—a woman is often employed at this work—and is run into perforated sheets in shallow moulds. The sheets are packed on to bogies, and are run along to the building where “the stack” is to be built up. The result sought to be attained by this stacking is the precipitation of the white pigment on the surface of the sheets through the action upon them of certain acids. The pile is carefully built up in a tolerably lofty but floorless building. First a layer of tanner’s bark is put down, and upon this is placed rows of little pots filled with acetic acid (wood vinegar). Over these latter are ranged the sheets of lead, and layer after layer is built up in this fashion until the building is nearly filled.

The stack is allowed to stand for about three months, when it is carefully taken to pieces. The sheets are then found thickly encrusted with the substance known as white lead, and this substance is broken off the plates and ground fine by a wet process, which prevents any dust from arising during the operation. The unconverted lead is taken back to the melting pots, and in due time is again ladled into the moulds. The wet lead pigment is lifted into thick ware dishes from the tanks or receivers attached to the grinding apparatus, and the full dishes are carried by women into a lofty but narrow stove chamber, where, for the purpose of thoroughly drying the product, they are left for three weeks.

Then comes the operation of “drawing the stoves,” and packing the contents of the dishes for carriage from the works. The dishes are handed down from the lofty shelves by women stationed on little plank scaffoldings to others down below, and a continual line of laden workers is maintained between the stove chamber and the packing barrels. In the manufactory to which we shall refer presently the distance between the stove door and the barrels to be filled is only about ten or a dozen yards, and the women carry the full dishes in their arms—pressed against the breast—and upset the contents as gently as possible into the barrels, the dishes being directly afterwards placed upon a heap of empties stacked up near the stove door. The barrels are lined with brown paper, and, when they are filled, the white lead is covered over with this material, and the receptacles are securely “headed up.”

It may be conceded that in none of the above processes is there absolute safety for the workers. The fine dust of white lead is, and

must of necessity be, present in the atmosphere, and the workers breathe it, whilst they may get the wet material worked into their finger nails. However, there are three of the operations which are attended with special danger, namely, the handling of the white lead as it is taken from the plates after they are unstacked, and the setting and drawing of the stoves.

It will have been noticed that by far the greater portion of the cases of plumbism that have become known to the public have occurred to women, and this circumstance is explained by the fact that the "stoving" and "drawing," and the "unstacking" processes are almost entirely worked by females, whilst the men, who are mainly engaged in the work of wet-grinding the lead—comparatively speaking an innocuous operation—are much more careful of themselves, both in regard to measures of cleanliness and the use of respirators.

But there is a class of casual workers with whom there is very often trouble. These are inexperienced people, who alternate this kind of labour with other employment, and who do not remain long enough at the white lead business to comprehend the necessity of the precautions that must be taken to guard against its dangers. Some of these women object very much to the "everlasting bathing" required of them, and they need constant watchfulness to prevent them from breaking the regulations of the place both in this and in other points.

The dangerous processes of "stoving" and "drawing" require to be gone through here about once a week, and the women are told off to the work as nearly as can be arranged in their turns. Respirators were provided for their use in this work, but despite of all rules and regulations promulgated on the subject, it has been found impossible to prevail on the women to wear these appliances. Against the respirators is urged the difficulty experienced in breathing freely through them by the carriers engaged in bearing tolerably heavy weights. The women say that they want to breathe as freely as possible when carrying the dishes of lead in their arms, and at times they want to clear their mouths by spitting out—both of these operations being hindered by the respirators. We tried the experiment of carrying one of the full dishes from the stove to the packing barrel, and we readily came to the conclusion that a person so employed will be troubled by any hindrance to freedom of respiration, be that hindrance ever so slight.

Colic, palsy, and eventually death are the results which attend the absorption of lead into the system, and although some constitutions are more susceptible than others to the influence of the poison, yet in the most favourable cases the question involved is one of resistance—not one of immunity.

Also a shorter description in a previous report by Mr. Redgrave, published in 1882, on what he terms “this sadly injurious and occasionally deadly occupation.”

“The lead is received in ‘pigs.’ These are melted in a furnace, and then cast in water or in moulds of various forms best suited for the action of the acetic acid. The acid is placed in pots of earthenware, on which the moulded lead is placed, and the pots are then arranged in large chambers called stacks, and covered with tan; row after row of pots and tan are placed one above the other, until the stack is full, in which condition the stack remains for about three months. Carbonic acid gas is evolved during this time, escaping through the ventilators, and causes the deposit of white lead on the moulds of lead.

“If the above were the only process it would be comparatively innocuous, but it is the work that succeeds from which the evil of lead-poisoning arises.

“The tan is carefully removed from layer after layer; white lead is found caked upon the moulds of lead, but a very little motion causes it to break up into powder. The lead loaded with this deposit is then carried in trays and emptied into cisterns of water, through which, by agitation, the white lead passes to the grinding mills, and the blue lead is raked out of the cisterns for further use. After being ground in the wet state the material is placed in pans and carried into the ovens to be dried; it is then carried from the ovens to the warehouse to be packed in barrels.

“Such are the principal processes in which females are employed, and which are most prolific of disease and death.

“The injuries to health arise from the external contact with the skin of the white lead, whether in the dry or moist condition, and the inhalation of the dust or powder into the lungs, or its being imbibed into the stomach through the mouth.

“As for the prevention, external or internal, no means have yet been discovered by which this could be attained. The mitigation

of the evil lies in excessive and enforced cleanliness, and with the use of special clothing and appliances when at work."

These descriptions speak for themselves, and speak of what has been going on for years under what we must term the "old time" stack process, and in themselves need no further comment, save that the description in the Newcastle paper is of a visit to some white lead works—where everything is done to prevent the fatal effects of the poison—and also to press upon the reader's attention, for comparison with further statements by the same authority, Mr. Redgrave's words: "As for the prevention, external or internal" (of "the injuries to health"), "no means have yet been discovered by which this could be attained. The mitigation of the evil lies in excessive and enforced cleanliness, and with the use of special clothing when at work."

III.—WHAT THE GUARDIANS SAY.

Let us peruse some of the communications from Boards of Guardians to the Home Secretary, as extracted from the Report just published, which shows how thoroughly these gentlemen are alive to the state of affairs, and not only as "a pecuniary question in which the ratepayers are directly interested," but also "that of the health, and indeed life, of a large section of the labouring class."—*Vide* Report of Infirmary Visiting Committee, Shoreditch.

GUARDIANS OF THE POOR OF THE PARISH OF ST. LEONARD,
SHOREDITCH, MIDDLESEX.

Clerk's Office, 213, Kingsland Road, London, E.,

SIR,

May 10th, 1882.

I am directed by the Guardians of the Poor of this parish to forward you the enclosed copy of a Committee's Report on the subject of lead-poisoning as evidenced by the number of patients admitted to the Infirmary of this parish suffering therefrom, which Report the Guardians unanimously adopted.

I am, Sir,

Your most obedient servant,

(Signed) ROBERT CLAY,

Clerk.

To the Right Hon. the
Secretary of State, Home Office, S.W.

PARISH OF SAINT LEONARD, SHOREDITCH.

EXTRACT from a REPORT of the WORKHOUSE AND INFIRMARY VISITING COMMITTEE, adopted by the Guardians of the Poor of the above Parish at a Meeting held on the 3rd day of May, 1882.

It was referred to your Committee to consider the question of the frequency of cases admitted to the Infirmary suffering from lead-poisoning, and whether any steps should be taken by the Guardians in connection therewith.

While your Committee approached this reference as a pecuniary question in which the ratepayers are directly interested, that of the health, and indeed life, of a large section of the labouring class necessarily obtruded itself.

Dr. Forbes, Medical Officer of the Infirmary, informed your Committee that during the past 18 months 23 patients have been admitted to the Infirmary, suffering directly in various forms from the effects of lead-poisoning. The duration of the stay of these patients in the Infirmary, except where death occurred, which was so with three cases, varied from three or four weeks to six months, and some unfortunately will, in all probability, remain paupers for life. Taken in connection with the fact that many of the sufferers have families dependent upon them, the gravity of the charge upon the ratepayers will be at once apparent.

Four patients in the Infirmary, on the day of your Committee's visit, were brought before them, and their cases alone would be sufficient to show the importance of the question under consideration. Although not now acutely ill, their dropped hands and paralysed feet were indeed pitiable to behold.

* * * * *

[Following this are descriptions of four cases at considerable length, which are commented upon in the course of this Paper, and the Committee in conclusion say,]—

They recommend your Board to lay the facts elicited by your Committee before the Home Secretary, with an expression of hope that the matter will receive the earliest possible attention.

GATESHEAD UNION,
 Poor Law Union Offices, Gateshead,

June 5th, 1882.

SIR,

I am directed by the Board of Guardians of the Gateshead Union to inform you that they have lately had under consideration the subject of white lead-poisoning, and at a meeting held on the 23rd ultimo, the resolution, of which I send a copy on the other side, was passed by the Guardians.

I have the honour to be,

Sir,

Your most obedient servant,

(Signed) SHAFTOE ROBSON,
 Clerk to the Guardians.

The Right Hon.

Sir Wm. Vernon Harcourt.

“That as the attention of the Board has frequently been called to the great fatality attendant upon the employment of females in the white lead works of the neighbourhood, and that decrepitude, palsy, blindness, and often death are the frequent results of lead-poisoning, that the Board memorialise the Home Secretary to establish an inquiry into the method of such employment, with the view to the introduction of machinery to do the most dangerous part of the work.”

An extract from the *Newcastle Daily Chronicle* of May 24th, 1882, will show some circumstances connected with the above resolution, and brings out the fact that many cases of lead-poisoning never come before the Poor Law Guardians or the public.

“GATESHEAD GUARDIANS AND LEAD-POISONING.

“At the fortnightly meeting of the Gateshead Board of Guardians, yesterday, the Clerk (Mr. Shaftoe Robson) read a Report in the *Masters' Journal* respecting the death by lead-poisoning of Elizabeth Boyle, aged 26, the whole of the facts in connection with which have already been given in the *Chronicle*. The Chairman of the Board (Ald. Hindmarsh) said he was very glad there had been an agitation got up on this matter, and he hoped it would continue till they got some remedy. Only a few nights ago a girl came before the Committee whom he was very sorry to see—a strong, healthy-

looking girl, who had actually become blind from lead-poisoning. Whatever they (the Guardians) did, they did not seem to be able to persuade these people not to go back to their work after being once affected. The girl to whom he had just alluded went a second time. She had lost her sight in consequence, and probably would now be on the parish permanently. Mr. J. D. Caris said the matter had been referred to the House Committee, and the Medical Officers of the Union had been requested to furnish them with the number of cases that had occurred within the last twelve months. Instead of a full statement of all the cases, a report was placed before the Committee showing that only nine cases in the twelve months had been introduced into the house, and upon inquiry he found that these were merely the severe cases, in which the lives of the sufferers had been in serious jeopardy, and one of which had proved fatal. They found that ordinary cases of lead-poisoning were not included, that cases treated out of the Workhouse were not mentioned, and that the report was made only by one medical officer for one-half of the Union. Only a day or two after the committee meeting he came in contact with a case where a young girl had entirely lost the sight of one eye through lead-poisoning. Then at a meeting of the Committee of the School Board, to inquire into people's inability to pay school fees, they came across two other cases. One was that of an apparently strong and powerfully-formed woman who was unable to get her living, owing to her having become palsied from the same cause. He held that it was not the number of deaths that occurred, but where a number of people were employed in work through which they became prematurely decrepit, unable to follow any avocation, and a burden to the ratepayers, that it was their province to take the matter fairly into account."

POPLAR UNION.

Clerk's Office, High Street, Poplar, E.,

SIR,

July 11th, 1882.

I am directed by the Board of Guardians of this Union to call your attention to the number of cases which have come under their notice requiring parochial relief, in consequence of illness arising from working in the lead factories in the neighbourhood.

I enclose a list of persons who have become so afflicted during the last twelve months. In many cases the illness was of long

duration, rendering a lengthened residence in the sick asylum, at a great charge to the ratepayers of this Union. The burden of their maintenance has been very heavy, and the Guardians trust you will be able to propose some means by which the factory inspectors may be required to see that proper means are provided for the use of those working in the lead factories, and that those means are constantly used by them.

The Guardians believe that if proper supervision could be effected in this respect, the number of persons so suffering would be very greatly diminished.

I am, Sir,

Yours faithfully,

The Right Hon.

(Signed)

JAS. R. COLLINS.

Sir Wm. Vernon Harcourt.

Followed by a list of 30 persons affected by lead-poisoning.

Let us bear in mind that in spite of this letter, and the special inquiries of Mr. Oram (*vide* rest of the Report), the cases of a lead-poisoned mother and her child have called public attention to this district, as already commented upon.

NEWCASTLE-UPON-TYNE UNION.

Newcastle-upon-Tyne,

RIGHT HONOURABLE SIR,

July 24th, 1882.

At the meeting of the Guardians of the Poor of the Newcastle-upon-Tyne Union, held on Friday, the 21st instant, I was instructed to inform you that the question of lead-poisoning has been under the careful consideration of the Board.

From the number of cases of this description which are constantly coming under the notice of the Guardians in consequence of applications for relief, it was resolved to impress upon the Government the desirability of carrying out the recommendations contained in the report of Mr. Redgrave, Chief Inspector of Factories, as to the precautions which can be enforced under the Factory Act, and as to the need of further powers for the protection of persons employed in white lead works.

Further, to urge that steps should be taken to compel owners of such factories to use every possible means for enforcing cleanliness on the part of their employées.

I have also to add that it is the opinion of this Board that white lead works should be placed under Government inspection, with a view to ensure the regulations affecting the health of the workpeople being strictly attended to.

I have the honour to be,
Right Honourable Sir,
Your most obedient servant,

J. W. GIBSON,

Clerk to the Guardians.

The Right Hon.

Sir Wm. Vernon Harcourt.

HOLBORN UNION.

St. James, Clerkenwell; St. Luke, Middlesex; St. Andrew and St. George-the-Martyr, Saffron Hill; St. Sepulchre, Middlesex; Furnival's Inn and Staple Inn; Charterhouse.

Workhouse, Gray's Inn Road,

SIR, London, W.C., *August 8th*, 1882.

I am directed by the Guardians of the Poor of the Holborn Union to forward for your perusal a copy of a report which they have received from the medical superintendent of their infirmary on the subject of lead-poisoning.

I am further directed to state the Guardians hope the matter will receive the consideration of Her Majesty's Government.

I am,

Your obedient servant,

The Right Honourable

JAMES W. HILL.

Sir W. Harcourt, M.P.

REPORT of the MEDICAL SUPERINTENDENT on LEAD-POISONING,
HOLBORN UNION WORKHOUSE INFIRMARY, JUNE 22nd, 1882.

Having been requested by the Infirmary Committee to make a report on the subject of lead-poisoning, and the occurrence of the disease produced by the introduction into the human body of that metal amongst the patients in this infirmary, I beg to place the following facts before you.

During the past 12 months 54 patients have been admitted into this Infirmary, suffering from the effects of lead-poisoning. Six only of these cases were males, the remaining 48 being females.

The greater number of cases occurring amongst females is due to the fact that more women than men are employed in the manufacture of white lead.

The time which these patients remained in the Infirmary varied from three weeks to three months, and only one case ended fatally ; and this patient, a woman named Kate Herrick, died within some few hours of her admission. An inquest was held on her body, the jury returning a verdict to the effect that death was due to failure of the heart's action while suffering from lead-poisoning.

At present there are only four cases of this disease in the Infirmary ; three of these being women and the fourth a man.

* * * * *

The workers who are engaged in the preparation of the carbonate or white lead from the metal itself are those who are exposed to the dangers of lead-poisoning in its worst forms, but even here those who work in the parts of the lead factory where the white lead is in a wet state, have far greater chances of escape than those whose special task takes them into places where the air is filled with the dry white carbonate.

It should be observed also that those workers who handle the metallic lead are but little subject to the disease.

The air laden with the particles of white lead is breathed in by the workers and carries the poison to the lungs ; some part is also retained in the mouth and is swallowed by the saliva, and it is believed it may also effect an entrance into the system through the skin, especially when in a state of perspiration. The means taken to prevent the lead thus mixed with the air from entering and affecting the system consist of a respirator, which should be an efficient one, to be worn over the mouth and nose, a covering for the head, and a long calico overall to protect the body down to the feet, and keep the dust not only from touching the skin but from alighting on the clothes, and becoming a source of future danger. Gloves are to be worn on the hands, and the water to be supplied for drinking purposes has sulphuric acid added to it. In addition, particular cleanliness is required in washing the hands and face before taking food, or when leaving off work.

The symptoms presented by the patients who have been admitted into this Infirmary, after having been exposed to the operation of

lead, are severe griping pains, termed colic, over the abdomen, with constipation, and often with severe and distressing vomiting lasting for some days. The skin is dry and scaly, and the patient looks sallow and unwell, the appetite is gone, and there is a peculiar taste in the mouth, a blue line is also to be observed in most of the cases on the gums. In some of the worst cases, the patients were at times quite delirious, with alternating periods of unconsciousness, and days have elapsed before these conditions changed, and the patients shown any sign of improvement. Loss of strength was also complained of, especially weakness of the wrists and legs, but in a few cases only did the patients become paralysed in the muscles of the forearms. Epilepsy has been caused in two cases by the lead, and some of the patients who have been affected by the same metal have since in consequence suffered from attacks of gout.

* * * * *

J. C. M'LEARN, M.D.,
Medical Superintendent.

IV.—MR. REDGRAVE ON THE SITUATION.

Upon the details furnished, from which we have extracted, Mr. Redgrave reports as follows to the Home Secretary :—

“ Whitehall,

“ SIR,

“ *November 30th, 1882.*

“ In compliance with your instructions that I should consider whether it were possible to lay down any regulations which would reduce the danger to health attending employment in the manufacture of white lead, I have the honour to submit for your consideration the following report.

“ As I stated in my communication of the 29th April last, both the Inspectors and I had at various times discussed with manufacturers of white lead the question of improved and special sanitary arrangements, but with the view of making myself thoroughly acquainted with the different operations as carried on in the various works, I have visited all the white lead works in the kingdom, save two or three.

“ There is not one such work in Ireland, and only one in Scotland.

“The careful inquiry which I have made has shown me that the temporary illnesses and permanent disabilities which affect those working in white lead far exceed anything that has come before the public.

“Occasionally there is a somewhat sudden death, an inquest is held, and public attention and sympathy are roused, but the excitement soon passes away, and but little permanent effect has resulted from publicity.”

Followed by the statements of three patients elsewhere commented upon.

Mr. Redgrave then proceeds to describe investigations made in Poplar district by Inspector Oram, but adds that the cases that come under the notice of Guardians and other authorities do not represent the full extent of the evil, for the medical attendant at one white lead factory stated that 64 cases were referred to him in nine months; and at another there were 134 cases between May, 1881, and October, 1882. He then describes the steps he took, and the information he received from the different white lead works, and his inspection thereof; in course, he refers to one factory called “No. 1 Works,” to which special attention will be called further on. He also speaks of works where it is sought to produce white lead by precipitation; but as hitherto all efforts in that direction have failed—the product being crystalline, and not homogeneous, forming but an inferior base for paint, and also requiring as much washing and drying as the “stack” process—it may be questioned whether these expensive works are practically useful. He goes on then to make his recommendations as follows:—

“There yet remains the question how far it would be feasible, as it is most seriously demanded, to lay down in an Act of Parliament regulations which ought to be observed in all white lead works, and the non-compliance with which should disqualify a factory from carrying on the trade of the white lead manufacture.

“The manufacturers with whom I have been brought into contact expressed themselves ready to adopt any suggestion I would make to them, and most manufacturers stated they were quite prepared to accept compulsory regulations, provided they were impartially enforced in all white lead works.

“ Looking therefore to what is being done now in the white lead works, in which most has been done for those working in them, I would urge that the precautions there adopted should, so far as is possible, be made compulsory in all. This can only be attained by an Act of Parliament.

“ Such an Act of Parliament should recite the conditions under which the manufacture of white lead should be carried on, and acting upon the results of my investigation I am of opinion that these conditions should be :—

1. That there should be provided for each person working at any stove, rollers, whitebed, or tank, an overall suit, head covering, boots, gloves, respirator or covering for the mouth and nostrils.
2. That there should be provided, in a distinct and separate part of the works, means for washing faces, hands, and feet, with supply of hot and cold water, soap, towels, nail, and clothes brushes.
3. That there be provided, in a distinct and separate part of the works, a dining-room.
4. That there should be provided baths with hot and cold water, soap, towels.
5. That a sufficient supply of acidulated drink, accessible to all persons, be kept on the works.
6. That there should be sufficient means for ventilating the stacks and stoves.

“ In order to ensure the observance of the above regulations it would be necessary to enact :—

Firstly. That after a date to be specified it should not be lawful for anyone to carry on the trade of a white lead manufacturer until he had the certificate of the Secretary of State that it had been proved to his satisfaction that the precautionary arrangements enumerated in paragraphs 1, 2, 3, 4, 5, and 6 were fully adopted.

The certificate of the Secretary of State would be founded upon the report of the Chief Inspector of Factories.

Secondly. That there should be special rules framed on every work for compelling the observance of the regulations laid down.

“ That these special rules should comprise the following, to which

would be added such others as special circumstances might appear to require:—

7. That each person shall at the stated times wear the dresses, &c., provided by the firm.
8. That each person before going to a meal or leaving the factory should put off such dress, &c., and wash thoroughly hands, face, and feet.
9. That chewing or smoking be prohibited.
10. That no person enter the dining-room to take meals until after the washing.
11. That each woman working at the stoves have a bath after finishing her day's work.
12. That no woman enter the bath before her hands and feet have been thoroughly washed.
13. That no person be allowed to enter a stove when the atmosphere in it exceeds 65 degrees.

“The special rules for each white lead works should be forwarded for the approval of the Secretary of State, embracing paragraphs marked 7, 8, 9, 10, 11, 12, 13, and upon his approval the rules should be binding.

“The Mines Acts, as to general precautions and special rules, provide a precedent which may be applied to white lead works.

“I have been greatly impressed with the value of periodical medical examination. In many works a medical officer is appointed by the employer, who attends to all cases sent to him free of expense to the patients; but when loss of work is likely to follow a visit to the doctor, a person slightly affected puts off the visit until the ailment has made progress, and restoration to health becomes in the end more protracted. I would gladly see the arrangement for periodical inspection instituted with such good effect by the regulations of the firm No. 1, and in one other factory in which men only are employed, followed in every white lead work; but it would be carrying legislative regulations to too extreme a point to insist upon this, especially as it has been urged upon me in the strongest terms that English firms have already to strain their utmost to contend with foreign competition, and that great care must be taken not to burden our manufacturers with restrictions which would still further hamper the trade.

“In conclusion I have to express my thanks for the courtesy of the gentlemen whom I have consulted, and for their readiness to afford every information in their power.

“I have the honour to be, Sir,

“Your obedient servant,

“The Right Hon. (Signed) “ALEX. REDGRAVE.
“Sir Wm. Vernon Harcourt.”

Concerning the Act of Parliament he thus advocates, the *Times*, April 17th, comments as follows:—“Mr. Redgrave suggests the passing of an Act of Parliament by which factories of the latter class should be compulsorily raised to the level of the former; and he advocates systematic medical and other inspection. He does not seem to realize the enormous, the practically insuperable, difficulty of making poor and ignorant people observe a variety of minute precautions, especially such as take the irksome form of compulsory and unaccustomed cleanliness. It is impossible to doubt that such precautions, if ordered by Act of Parliament as a condition of the carrying on of lead works, would be systematically evaded by those for whose benefit they were designed, and could only be enforced by inspection of such a nature that it would add materially to the cost of production, and would do what Mr. Redgrave elsewhere reasonably deprecates, by placing the British manufacturer at a disadvantage with regard to foreign competition.”

And this all experience will prove a just comment—failure must attend the attempt to get the workpeople to conform to the minute rules laid down. But there is a further cause of failure admitted by Mr. Redgrave himself in the previous report presented last year, already quoted. It is this,—that no amount of precaution can “avert” lead-poisoning under the old stack process. All that can be hoped for is “the mitigation of the evil.”

To this point let us direct our attention, taking the evidence produced by seven cases cited at length in the Report, as showing how fruitless the very precautions recommended have proved in these instances; and, as yet more conclusive, we will examine the evidence to be gathered in the Report as to the white lead works named “No. 1,” which Mr. Redgrave speaks so highly of and proposes as the standard all others should be brought up to by legislative enactment.

V.—THE SEVEN WITNESSES.

In the Parliamentary Paper, 1882, pages 1, 2 and 6, there are cited seven cases in a passing way, four by the Infirmary Visiting Committee of Guardians of St. Leonards, Shoreditch, "A," "B," "C," "D," and three by Dr. McLearn, Medical Superintendent of Holborn Union Workhouse, denominated "I.," "II." and "III." These cases are fairly representative. Let us analyse their statements with the view of testing whether the recommendations made by Mr. Redgrave as to be authorised in an Act of Parliament, are likely to be really effective in removing the monstrous evils connected with the present system of white lead manufacture.

It will be seen that the means upon which so much stress is laid as calculated to remove the dangers to the operations, and which the Legislature are invited to render binding by Act of Parliament, have been more or less fairly used by several, and in some points by most of the seven cases cited, and to have proved so futile a barrier to the poisonous effects of the manufacture, that after short periods of work of from three weeks to two months, they have been left (often with dependant families) in ruined health lasting for months, and in some cases probably for life, a burden on the unfortunate ratepayers of the parishes where such works abound. If the deductions are correct, it is plain that far more vigorous means are required. Women, specially casual workers, should be forbidden, and if there is any process by which the evils can be avoided it should be adopted. The argument advanced by manufacturers and quoted by Mr. Redgrave, "Great care should be taken not to burden our manufacturers with restrictions that would still further hamper the trade," as they have "to contend with foreign competition,"—should not weigh against the destruction of health and often loss of life.

ANALYSIS OF THE EVIDENCE OF THE SEVEN WITNESSES.

OVERALLS.

First, on the subject of overalls or clothing for the purpose of keeping the white lead dust from the clothes and persons of the workers.

"B" states, "Women at stoves were supplied with a covering for their dresses which, however, *was not much good.*"

“C” “was supplied with a piece of coarse wrapping to cover her from the waist; this wrapping became smothered in lead . . . *it made her dirtier than her own apron.*”

“I.” “The overalls were *always dusty.*”

“II.” “Long calico gowns were given to each woman to cover her dress with, but these were always covered with white lead dust, and *did not keep the white lead off the clothes.*”

“III.” “The calico overall was always full of lead dust, and on leaving every evening *my clothes were white with lead.*”

According to above testimony, five out of the seven witnesses had “overalls,” yet the protection afforded appears next to nothing, as they succumbed after periods of three to eleven weeks at the work.

Light is also thrown on this subject by “D.” “*Dust came from them like a miller, and used nearly to choke them.*”

How fruitless the attempts to clothe some 40 to 50 women of the casual working-class so as to prevent the deadly poison of white lead being deposited *in* their clothes, perhaps their only suit. The new Act of Parliament, as recommended, will only partially touch this evil, as after going through an amount of expense, trouble and labour requisite to provide, keep clean, and keep clothed with overalls; the deposit of white lead dust on their inner clothing will at most be but lessened.

To do away with the employment of women in such labour is peremptorily needed, but the only effectual remedy is to carry on the manufacture without raising this poisonous dust.

RESPIRATORS.

Second, as to Respirators. Closely connected with the overalls are the respirators. The testimony about them is brief. They were worn but by two.

“I.” “Had no respirators until recently.”

“II.,” who says, “They gave me a respirator to wear, but *I could not do the work with it on.*”

As “I.” says, “*The air in the factory was always full of white lead dust,*” it naturally suggests the enquiry, why one of the most important safeguards should be so little used? The testimony of “II.,” as above, gives the reason, corroborated by the statements

of two different firms in their answers to Mr. Redgrave, see page 10. One writes as follows:—"Head coverings are also provided, but the women, as a rule, will not use either these or respirators, as the coverings heat the head . . . and the respirators are troublesome." And the other, "Respirators are provided, but workpeople will not, as a rule, use them." Thus, as Mr. McLearn, M.D., says, on page 5, "The air, laden with the particles of white lead, is breathed in by the workers and carries the poison to the lungs; some part is also retained in the mouth and is swallowed with the saliva."

Thus there is this dilemma. Without respirators, lungs and stomach get filled with the dangerous white lead; with the respirators, the perspiring, half-choked women cannot work.

The only solution is to clear from the air they breathe the poisonous floating dust, and no longer expose helpless women to its noxious effects.

WASHING ARRANGEMENTS.

Third, as to washing. "A" (about 40 men employed) says, "There was a place to wash at the factory, but *it was very dirty* . . . Soap was supplied them."

"B." "There were about 50 women employed, for whom a trough was filled with water, a pail in which to wash . . . If the master saw a woman going out without her hands having been washed, she would be sent back. Fresh water was supplied three times a day. All washed in the same water, which quickly became white with lead, and at the bottom was quite *a thick settlement*; soft soap was supplied." At second factory: A basin for each woman, who filled it for herself at a tap; soap issued every day; two jack-towels every day for about 30 women.

"C." Same as that worked at by B.

"D" worked at same factory as C; but used the tap to wash at instead of the trough.

"II." "There was always plenty of soap and clean water to wash with . . . There were always nail brushes."

"III." "There was always plenty of soap and water."

Thus six out of the seven describe washing arrangements, more or less complete, and yet ineffectual to keep them from being, in a

few short weeks, so poisoned by the dangerous manufacture as to become helpless, and chargeable upon their respective Unions.

To carry out washing arrangements for such a number of women, most of them on casual employment, is a labour in itself, more especially when the amount of white lead dust deposited on them, and the dislike of such a class of worker to soap and water is considered. Rules may be laid down by Act of Parliament, but only very strict and capable management can keep them constantly in effect with all the employées—and even if carried to the furthest, the preventive effect would be but partial.

What is needed is that none should be brought in contact with the white lead, whether as dust or otherwise; that alone will keep it from their bodies. Unless the Act of Parliament is so framed, it will afford but a partial relief.

ACID MIXTURES.

Fourth—Medicated drinks for the purpose of neutralising the poison imbibed.

“A” says, “Sulphuric acid preparation was supplied to drink; but A only once took it, *for it made him ill.*”

“B.” “A drink was supplied . . . The work caused great thirst.”

“I.” “I took the medicine three or four times a day.”

“II.” “There was always medicine there, and I sometimes took it.”

“III.” “There was always acid medicine, and I took it every day. If the master saw any woman go for a drink of water he used to tell her to drink the medicine instead.”

The above testimony shows how vain it is to expect that any chemical antidote will neutralise the poison so continuously imbibed into the system of these poor workers, already weakened by the poverty and need which alone drives them into such deadly labour.

Instead of prescribing acid drinks by Act of Parliament, for white lead works, the Act ought to go deeper, and prohibit these weak frames being exposed to such wholesale and continuous poisoning, through lungs, stomach, skin and clothes. What would be thought of allowing an impure well to continue supplying a

neighbourhood with water—sanitary authorities merely leaving in every house the best antidotes they could find against typhoid fever, diphtheria, etc.? Would not the right course be, at any expense, to *stop the well*, and procure water from another source?

Summing up the testimony given as to the effect of using the chief precautions in the seven cases mentioned in the Report, we cannot be very hopeful as to what an Act of Parliament will do, so long as the manufacture is conducted by the process at present in use. But this is not all. It may be objected that in these cases there is no proof of careful use of the means provided, and that they are from works where inefficient supervision is in existence. We will therefore go further, and that matters may be thoroughly clear, invite our readers' attention to the case of "No. 1" white lead works, as given in Mr. Redgrave's Report. We shall see from it that, from the very white lead works held up as a model for all others which are to be brought by Act of Parliament up to its standard, there is an outcome of lead-poisoning, set forth and admitted, enough to stagger all attempts at improvement.

VI.—THE CASE OF "NO. 1."

We print at full length the information given in Mr. Redgrave's report, as it throws a strong light upon the state of affairs, both as at present and also in event of the proposed legislation being carried out.

"No. 1."

Rules and Regulations to be observed by Men and Women employed at the ——— White Lead Works.

1. That each man or woman, before starting work at any stove or rollers, receive from the foreman or bath superintendent one overall suit or slip, head cloth and respirator; and each woman, when working at stoves, to take off *all her own clothes*, when flannel combinations with oilskin petticoat will be provided in addition to the above.

2. That each man or woman working at any stove, rollers or white bed, before going to breakfast, dinner or home, must put off their overall suit, brush every particle of lead dust from their

clothes, wash in the lavatory, take care to clean their nails thoroughly, wash their feet in the large cistern, and use soap, towels, nail, tooth and clothes brushes, which are provided by the firm.

3. Smoking and tobacco chewing strictly prohibited during work hours.

4. That no person is allowed to wash or dress in the dining-room.

5. That each woman must have a bath once a week; and each woman working at the stoves to have a bath after finishing her day's work, but to wash her hands and feet thoroughly before going into the bath.

6. That no man or woman enter the dining-room to take any meals without attending to Rule 2.

7. That all men and women wash out their mouths before taking food or drinking anything.

8. That all men and women go to the foreman before leaving work, and after washing, to get a glass of "treacle beer;" and those men and women working at stoves to get at the same time a dose of salts.

9. Before commencing to strip the white bed, the foreman to see that the lead is well watered, and the gangway outside stacks and leading to rollers be constantly watered to keep down the dust.

10. The medical attendant will call at the works one day a week, between 12 and 1 mid-day, to see each woman, and it is requested that they will answer all questions and carry out his instructions.

11. In case of any man or woman not feeling *quite well*, it is requested that they will *at once* either send to the doctor's or a message to the works, when the doctor will call to see them. No charge is made for either medical attendance or medicines.

12. Salts are always kept at the works, and anyone can have a *dose* by applying to the foreman or bath superintendent.

I have been favoured with a communication from the firm in whose works these regulations are in force, stating in what manner, minute as they are, they are insisted upon, and as what may be done in one factory would not be impossible in another, it is very important that I should make known the entire and complete insistence laid down by the firm:

“Most of the women assist either in setting or drawing a stove once a week (refer to Rules 1, 2, 5). After their work is over they partially undress before going into the wash-house. They first gargle their throat with treacle beer, then wash their arms, hands, lower part of their legs and feet; after which they each have a tepid bath. After coming out of the bath they wash their heads in warm distilled water, and lastly, brush their teeth. If by chance any of the women have not worked in a stove they are not compelled to wash their heads. If a woman shirks her bath during the week, the next time she comes to work the foreman orders her to have a bath that afternoon, and if she does not then have it she is not permitted to work again until she does.”

When I visited the works to which the two above codes of Rules apply, I had the opportunity of seeing the excellence of the bathing and washing arrangements, the manner in which cleanliness was insisted upon, and the administration of the acidulated drinks, milk, medicine, etc.

In one case (No. 1) a surgeon attends regularly once a week, and examines every woman in the works; in the interval anyone complaining of illness is urged to see the surgeon at once.

As the “precautionary arrangements” which Mr. Redgrave suggests should be made legally binding, and the “special rules” he would require in such works are all seen in active operation in “No. 1,” and as not only do the firm testify that they compel the most minute attention thereto, but Mr. Redgrave himself also says, “When I visited the works . . . I had the opportunity of seeing the excellence of the bathing and washing arrangements, the manner in which cleanliness was insisted upon, and the administration of the acidulated drinks, milk, medicine, etc;” we are entitled to look on these works as “No. 1” in order of merit as well as in name, and the type of what stringent legislation would effect in removing the evils of the present state of affairs. Were no further information given we would be disposed to think no damage could be done to health in them, and exclaim, “Happy are the women in the employment of ‘No. 1;’ the effects of lead-poisoning are unfelt by them!” But there *is* further testimony, for Mr. Redgrave goes on to say:—“I have been favoured with a copy from the book of the medical officers attached to the Works No. 1 of the condition of the women in the two weeks when his periodical

examination first commenced, and of the two weeks immediately preceding my inspection at the factory :—

	No. of Women.			
	At Work.	Healthy.	Slight Symptoms.	Severe Symptoms.
In the week ended 31st May - -	15	8	6	1
„ „ 7th June - -	27	19	8	—
„ „ 26th September	19	17	2	—
„ „ 3rd October -	21	17	4	—

Let us investigate these figures. The first entry simply means, that this firm, whose ability and humanity are strikingly proved, and have rules so complete and minute, that they become the model for legislation, and care so excellent and scrupulous that Mr. Redgrave himself testifies to it, nevertheless produce in the week ending May 31st, out of a total of 15 women at work, no less than seven sufferers, one of them with severe symptoms, from lead-poisoning. In other words, 40 *per cent.* manifest lead-poisoning! Week ending 7th June shows 30 *per cent.* nearly!

Thus at that period, from some reason or another, all the scrupulously-framed and carefully carried out rules seem powerless to arrest the terrible poison. We need not wonder, however, if we remember the testimony we have already considered as to air filled with the white lead dust, and toiling women breathing it into the lungs, swallowing it into the stomach, absorbing it by the pores, in spite of all overall protection. How shall a wash once or twice a day, an acid drink, and a dose of salts prevent? As well live in a house subject to drainage emanations, or drink water polluted by sewage, and expect by any amount of dosing to escape malaise, fever, diphtheria, etc.

But there are two further entries to which the medical officer points with triumph, and justly so, for they exhibit a measure of success attending the active exertions of able and scientific men, working out the problem of how to keep down percentages of sickness by medicines and precaution, and medical inspections, weeding

out the weaker women and getting rid of those who show the traces of approaching "plombism."

Week ending 26th September, out of 19 employed, there are 2 sufferers, $10\frac{1}{2}$ per cent.; but shall we be satisfied with an addition of $10\frac{1}{2}$ per cent. from lead-poisoning weekly, running up an item of ill-health to be multiplied by the 52 weeks of the year, and bring its poverty to the families, and its rates to the taxpayers, and its miseries to the poor afflicted ones themselves? But the fourth and last entry claims our attention—the very week after this apparent quieting of the poison-fiend, he again breaks out and doubles in a twinkling the number of his victims; as for the week ending 3rd of October, out of 21 in employment, no less than 4 are suffering from the poison, nearly 20 per cent.! And this in spite of all the experience and efforts of the past.

No wonder Mr. Redgrave rather drily remarks upon the above statistics as follows:—"These figures, while they show the good effects of a careful examination of the workpeople, are also strong evidence of the necessity of continued and, if possible, of increased vigilance in combating the insidious attacks of lead-poisoning." We fear that the "if possible increased vigilance," backed up by the most rigid legislation, would never combat the "*insidious attacks*" of an enemy who, in the form of white lead dust, is allowed to take full possession of the air of white lead works under the present stack system.

We suspect that if we had a few years of medical records from works of the highest type carried on by "stack process," the average would not be less than the average of the four weeks presented to us in the above table, namely, 25 per cent.!

VII.—THERE IS A REMEDY.

In that important and recent work, "England," by T. H. S. Escott (Vol. I., chap. 10), after noting the various processes in white lead making, causing sad sickness and disease amongst those engaged therein, such as washing and brushing the pots in which the white lead is formed, etc., etc., it notes that some reforms have been instituted, and that machinery has been adapted to accomplish some work done hitherto by hand; yet there remains, notwithstanding, abuses to be rooted out. It then goes on to say:—"The

means have yet to be devised to prevent the inhalation of the white lead dust by the workers;" and then speaks of the "incalculable mischief" done by the absence of "universally enforced rules;" but all "universally enforced rules" will not lay the white lead dust under the old "stack" process.

If we got no further than this point things would look very black indeed; as to white lead manufacture, the old "stack" process, turning white lead works into very Augean Stables, leaving us no hope for the poor poverty-driven women but to suffer, and the rate-payers to pay for.

Some might hope for a solution of the difficulty by some other material being used as a base for paint; but full and prolonged trials have shown that the various substitutes proposed, such as "zinc oxide" and "silicate," and the yet more inferior "barytes," are one and all deficient in body and in lasting qualities.

In a letter from a correspondent to the *Times* lately, this is spoken of as follows:—"White lead still stands alone for giving body to paints. . . . When good white lead and good linseed oil have thoroughly set, they keep the peace and hurt no body, but flimsy paint soon becomes weak and powdery. An old country house painted with white lead and good oil fifty years ago, looks fresher than a modern one done last year with the builder's trash." Also Dr. Pybus, in his paper on "Health Topics," elsewhere quoted from, says:—"Other things of cheaper origin and more copious supply, as zinc oxide and barytes, have been substituted for lead carbonate, but none, we believe, possessing the enduring purity and protecting surface afforded by the old-fashioned paint."

These substitutes are also higher in price than the best white lead when prepared as paints, and practically become neither the staple market article dealt with, nor the usual accepted paint stipulated for in contracts, etc.

Thus we are shut up to white lead on the practical grounds of tested and general use, economy of price and durability of quality.

But happily there is the remedy, which we have already spoken of, whereby all this can be avoided, the labour of women dispensed with, the few men employed never exposed to the white lead dust, or even their hands brought in contact with it, the white lead produced of finest quality and colour (not an inferior precipitate compound), and all this in less days than the weeks occupied by

the old stack process, and, what is an important consideration, far more cheaply. The new patent process of Professor E. V. Gardner, of 44, Berners Street, London, W., now in operation at Deptford, in which, by electrical energy and the cheap production of carbonic acid applied through a special apparatus, in combination with the necessary acid vapour at the proper temperature, the formation of white lead of the purest colour and best quality is rapidly and cheaply carried out in closed chambers, the lead resting upon shelves, which are lifted out when converted (the men's hands not touching the lead), and emptied, without any dust being raised, into a combination of machinery closed in, from which it issues forth as white paint ground ready for market, or if required, can be provided as the dry powder. In either case the dangerous operations of the "white bed" so called, and washing and stoving are completely done away with, and no opportunity is given for the dust to enter the air or touch the persons of the workers. This has been alluded to in an able paper upon "Unhealthy Trades," contributed by Dr. J. A. Pybus, F.R.G.S., &c., to the *Commercial World* of September 1st, 1882, in which, after saying, "Most acute cases of lead-poisoning arise from the processes employed in producing the almost impassable powder forming the basis of the best white paint. . . . The chief sufferers too, are women, who from being able to carry on the tedious process at a cheap rate of wages, form a large proportion of the workers. Hence, chivalry should urge the sanitarians to spare no effort till the negligence and abuses connected with the trade are remedied." He goes on to speak of "the bright prospect of an entire revolution in the old Dutch process at present used in the factories. Professor E. V. Gardner has for some considerable period been perfecting a method (already patented by him), by which the labour of weeks will be completed in as many days, and the terrible dangers attached to the old plan altogether done away with. All philanthropists will wish him God-speed in his labours." Let us add—shall not the Legislature and public in every way countenance such a manufacture? Certainly; if white lead of a superior quality can be produced by his process at the market price, without injury to the health of operatives employed, it would be the duty, not only of Government Departments, such as Dockyards, to purchase white lead made in such a manner; but also all private individuals and Corporations, great or small, should make it a point

9. 4. 20
H. C.

of honour to support the manufacture, as carried on innocuously under Professor Gardner's admirable process. Let us hope the day is not far distant when the white lead stack shall no longer be built and pulled to pieces by the hands of poverty-driven, lead-poisoned women—being completely replaced by the above-mentioned harmless process. As licences to use the process will no doubt be granted to manufacturers by Professor Gardner, the evils of the old "stack" process should no longer be excused either by the legislature, the public, or the manufacturers themselves.

