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HOME OFFICE.

LEAD PAINT (PROTECTION AGAINST POISONING)

ACT, 1926.

Report

to

His Majesty's Secretary of State for the Home
Department on the Draft Regulations for
Preventing Danger from Lead Paint to
Persons Employed in or in connection
with the Painting of Buildings.

BY

SIR WILLIAM WARRENDER MACKENZIE, G.B.E., K.C.



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1. In pursuance of the powers conferred upon him by the Lead Paint (Protection against Poisoning) Act, 1926 (16 & 17 Geo. V. c. 37), the Secretary of State issued a Code of draft Regulations for preventing danger from lead paint to persons employed in or in connection with the painting of buildings.

2. The draft Code was published in the **London Gazette** and **Edinburgh Gazette** for 31st December, 1926, and together with a covering letter, dated 31st December, 1926, was sent to various persons and bodies concerned to the number of nearly 36,000. Copies of the draft Code and covering letter are set out in Appendix A. Notice was given in the covering letter and in the **Gazettes** that any objection with respect to the draft Regulations by or on behalf of any person affected thereby was to be sent to the Secretary of State in manner therein provided.

3. Objections in writing with respect to the draft Regulations were afterwards received by the Secretary of State. A list of objectors is set out in Appendix B. There were 16 objectors, some of whom were individual firms and companies, while others were federations and unions representing a large number of firms and persons.

4. On receipt of these objections the Secretary of State, having duly considered the same, directed an Inquiry to be held with regard to the draft Regulations and appointed me to hold such Inquiry and to report to him thereon.

5. In pursuance of such appointment and after due notice I held an Inquiry in public with regard to the said draft Regulations in London on the 21st and 22nd June and 29th July, 1927, when several of the persons who had made objections in writing to the said draft Regulations and persons who were affected by the same

appeared and gave evidence. A list of appearances at the Inquiry is set out in Appendix C.

6. The question of the regulation and prohibition of lead paint in painting buildings, vehicles, &c., has been the subject of consideration by the Home Office for some time. In 1911, the Home Office appointed two Departmental Committees to investigate the incidence of lead poisoning in the two largest trades concerned with painting, viz., buildings and vehicles. The Buildings Committee presented its report in 1915 and the Vehicles Committee in 1920. Both Committees recommended that the use of lead compounds in paint, except for special classes of decorative painting work of very minor importance, should be entirely prohibited, with the exception of a small percentage.^(a) It was not practicable during the War period to take any steps by way of prohibition or regulation. In 1921, at the General Conferences of the International Labour Organisation of the League of Nations held at Geneva a convention was agreed to the effect that each member of the International Labour Organisation ratifying the Convention undertook to prohibit after 18th November, 1927, with certain exceptions the use of white lead and sulphate of lead and all products containing these pigments in the internal painting of buildings, except where the use of white lead or sulphate of lead or products containing such pigments was considered necessary for railway stations or industrial establishments by the "competent authority" after consultation with the Employers' and Workers' Organisations concerned. The Convention contemplated the regulation of the use of white lead, &c., in operations for which their use was not prohibited and for internal painting up to the date of prohibition.

7. A draft Code of Regulations was agreed at Conferences of the Painters' and Decorators' Joint Industrial Council with the Home Office in 1922 with a view to having in readiness a Code of Regulations in the event of the Convention being ratified by the Government.^(b) The draft was accepted by the National Federation of Building Trade Employers of Great Britain and Ireland.^(c)

8. A good deal of controversy had in the meantime arisen as to the soundness of the recommendations of the two Departmental Committees, more particularly having regard to the study given to the subject and experience gained during the War.

9. In 1921, prior to the issue of the Geneva Convention, the Home Office appointed another Departmental Committee to

^(a) Report of Committee on the Use of Lead in the Painting of Buildings (Cd. 7882). Report of Committee on the Use of Lead Compounds in the Painting, etc., of Coaches and Carriages (Cmd. 630).

^(b) Sir Gerald Bellhouse, Transcript of Minutes of Evidence, First Day, p. 19.

^(c) Mr. A. G. White, Second Day, p. 14.

enquire into the subject, over which Sir Henry Norman, Bart., M.P., presided. This Committee issued a report in 1923, in which they recommended that dry rubbing down should be prohibited and that unless exhaust ventilation was locally applied a spray containing lead should not be used for interior work. They came to the conclusion that from a general review of the evidence that had been placed before them and in the light of experience gained since the previous Committees had reported, they felt they could not support the recommendations of those Committees that the use of lead paint for the painting of buildings be entirely prohibited, and they considered that as regards white lead, sulphate of lead and paint bases which contain these lead compounds those needs were adequately met by the agreement reached at the Geneva Conference and subsequently embodied in the Convention adopted there. They accordingly recommended that legislation should be passed to give effect to the principles therein contained.^(d)

10. The Government gave prolonged consideration to the above Report. It was urged that a new situation had arisen. The introduction of water-proof sand paper rendered, it was claimed, the wet rubbing down process generally practicable. Representations were made as to the distortion of trade that might be caused by prohibition. No steps so far had been taken to ascertain whether the risks of lead poisoning could be met effectively by regulation, instead of prohibition, as in other industries. The Government decided that an endeavour should be made in the first instance to eliminate poisoning by regulation. The Home Secretary plainly intimated in the House of Commons that the method by regulation was experimental and that if regulation should fail, prohibition would be enforced.^(e)

11. The Lead Paint (Protection against Poisoning) Act, 1926, was accordingly passed. It aims (amongst other things) at regulation and not at general prohibition, and for this purpose empowers the Secretary of State to "make regulations preventing danger from lead paint to persons employed in or in connection with the painting of buildings." It prohibits on and after 19th November, 1927, "any woman or young person" from being employed in painting any part of a building with lead paint, subject to certain exceptions: one of the exceptions being women who at the passing of the Act (15th December, 1926) were employed in any trade which involved as part of their occupation the painting of buildings with lead paint. The expression "buildings" in the Act includes fixtures. The Act confines the Regulations to the use of lead paint on buildings and fixtures; it does not prohibit or regulate its use for any other purpose.

^(d) Report of Departmental Committee appointed to re-examine the Danger of Lead Paints to Workers (1923), p. 31.

^(e) Hansard Parl. Deb., 1926, vol. 128, cc. 1055, 1059.

The difference between the provisions of the Geneva Convention and the Act of 1926 is that whereas the Geneva Convention proposed to prohibit after a certain date the use of white lead in the internal painting of buildings and regulate its use in external painting, the Act does not propose to prohibit the use of white lead, but to regulate its use only and to apply the Regulations to the external as well as the internal painting of buildings. The Act goes further than the Convention in that it includes fixtures; but in another direction the Convention went further than the Act in that it prohibited the use of white lead in painting the internal part of buildings.

12. A Code of Regulations affecting the painting of vehicles was issued on 12th March, 1926, by the Secretary of State under the title of the Vehicle Painting Regulations, 1926, and came into force on 1st May, 1926.

13. The Regulations now under consideration fall into two main groups: Those for suppressing lead dust and those for preventing or minimising the absorption of lead into the system by enforcing cleanliness and care. They are in substance the Regulations which were agreed at the Conferences in 1922 referred to in paragraph 7. They have since been approved—subject to certain modifications—by the Painters' and Decorators' Joint Industrial Council and the National Federation of Building Trades Employers of Great Britain and Ireland.^(f) When the draft Regulations were discussed in 1922 and again in 1927, their application to the painting of iron and steel work does not appear to have been specifically considered.^(g)

The Objections to the proposed Regulations consist of three main classes:—

(1) Those which allege inappropriateness of some of the Regulations to a section of work on iron and steel structures;

(2) Those which allege the inappropriateness of some of the Regulations to a section of workmen who are not ordinarily but occasionally employed in painting work; and

(3) Objections in the nature of drafting amendments for the purpose of carrying out more effectively the intention of the Act of 1926.

14. Five main groups of parties concerned expressed themselves at the Inquiry:—

(1) The Operative Painters, represented by Mr. Turner and Mr. J. A. Gibson on behalf of the National Society of Operative House and Ship Painters. They would like to see prohibition of lead paint, and do not believe that a system

^(f) Mr. C. M. Knowles, First Day, pp. 16, 27, 28; Mr. A. G. White, Second Day, p. 14.

^(g) Mr. C. M. Knowles, First Day, p. 17.

of regulation will be effective, but are ready and willing to assist in the strict observance of the Regulations.^(h)

(2) The Master Painters, represented by Mr. J. E. Butterworth, Mr. J. B. P. Dobie and Mr. A. Andrews. They are satisfied that the draft Regulations, if thoroughly and rigidly enforced with no exemptions, would be likely to eliminate lead poisoning.⁽ⁱ⁾

(3) The Home and Women Decorators, represented by Mrs. Elizabeth Abbott. The women decorators already in employment come under the Regulations, and other women decorators, it was contended, ought to be allowed to come in by an amending Bill. They are thus interested in seeing that the Regulations are of such a character that if and when women do come under them they will be protected against the dangers of lead poisoning.^(j)

(4) The Manufacturers of Lead Paint and Kindred Products, represented respectively by Mr. Harney, K.C., M.P., Mr. Dudley Sherwood and Mr. Conolly. They desire a rigid enforcement of the Regulations in order to establish a case for the continuance of white lead.^(k)

(5) The fifth group consisted of Employers mainly concerned in other industries but who employ workpeople in painting operations, such as the Engineering and Allied Employers' National Federation, represented by Mr. F. D. Lamb and Brig.-Genl. Baylay, D.S.O.; the National Federation of Iron and Steel Manufacturers, represented by Mr. J. A. Gregorson, the Shipbuilding Employers' Federation, represented by Mr. J. S. Boyd; the Railway Companies, represented by Mr. Conrad Gribble of the Southern Railway and Mr. R. Carpmael of the Great Western Railway; the Scottish Association of Bridge Builders and Structural Engineers, represented by Mr. Harry Cunningham; and the Dock and Harbour Authorities, represented by Mr. Gibson Smith and Mr. Ashby Cummins.

15. The first four groups were prepared to agree to the draft Regulations, subject to certain amendments submitted on behalf of the Painters' and Decorators' Joint Industrial Council. The parties comprised in the fifth group submitted considered opposition to several of the Regulations. It will be thus seen that the main objections now to be considered are not objections from the Employers and Operatives in the Painting and Decorating Industry, but objections from Employers in what may be described as outside Industries which carry on painting operations from time to time, chiefly for the maintenance of buildings.

^(h) Mr. Gibson, First Day, p. 97; Mr. Turner, Second Day, p. 10; Memorandum by National Amalgamated Society of Operative House and Ship Painters and Decorators and the Scottish Painters' Society.

⁽ⁱ⁾ Mr. Butterworth, First Day, p. 106.

^(j) Mrs. Abbott, Second Day, p. 14.

^(k) Mr. Harney, Second Day, p. 16.

DRY RUBBING DOWN.

16. The disease of lead poisoning is frequently fatal and in its severe form is incapacitating. The chief source of the disease is caused by inhaling dust impregnated with lead.^(l) In the painting of buildings, more particularly in house painting, this arises mostly in rubbing down the surface of a lead-painted structure in order to get a fine and smooth surface for re-painting. The rubbing down is necessary for two purposes:—for removing old paint and, where a fine finish is required, for removing all excrescences on the newly-painted surface and preparing it for the next coat. There is also an element of danger when paint gets into the workman's clothes and is not at once removed; the paint becomes dry, and then is brushed off in the form of dust and is liable to be inhaled. In a less degree there is some risk of lead paint getting into the human system by the operative, who has been in contact with lead paint, eating food with dirty hands, or possibly by absorption through the skin.^(m)

17. Regulation 3 (a) is framed with the object of eliminating lead dust. It provides that "No painted surface shall be rubbed down or scraped by a dry process." (See Appendix A.) The purpose of this draft Regulation is to place upon the employer the duty of rubbing down a painted surface by a wet process.⁽ⁿ⁾ Rubbing down is a process which hitherto has sometimes been done with a wet pumice stone, especially in rubbing off old paint; but where a finish is required, it has been considered necessary to do the rubbing down by a dry process with sand paper; this produces dust, and if the previous coat was lead paint, the dust is impregnated with lead. It is conjectured that a great majority of cases of lead poisoning among operative painters is due to this cause.^(o) Hitherto it has not been practicable to rub down wet with ordinary sand paper, as the paper rubs through as soon as it becomes wet. Now, however, a new form of sand paper has been produced in which the paper is water-proof. The use of this kind of sand paper thus enables the rubbing down to be done wet.^(o) The process is to sponge down or wipe down the surface with a wet cloth or otherwise make the surface damp; the surface is then rubbed down with water-proof sand paper, and the excrescences of the surface are rubbed off and a clean and smooth surface is produced without creating any dust.^(o) "Burning off" is not regarded as coming within the terms of Regulation 3.

18. The effect of using a liquid—whether water, spirit or a lubricant—on the painted surface varies according to the nature of that surface. In the case of stone, brick or timber buildings the rubbing

^(l) Sir G. Bellhouse, First Day, p. 20.

^(m) Sir G. Bellhouse, First Day, pp. 20, 21; Mr. Knowles, *Ibid.*, p. 8.

⁽ⁿ⁾ Sir G. Bellhouse, *Ibid.*, p. 24.

^(o) *Ibid.*, p. 23.

down can, generally speaking, be equally effectively done by dry or wet process; but the effect of rubbing down a painted surface of iron or steel work by a wet process is to set up corrosion of the iron or steel,^(p) and, if oil is used there is a tendency to create a filmy lining on which the new paint will not adhere.^(q) It was therefore contended that Regulation 3 (a) of the draft Regulations was impracticable in respect to iron and steel surfaces of the nature found in the roofs of railway stations, locomotive sheds, bridges, constructional engineering units, &c.^(r)

19. Three classes of employers took exception to the application of a wet process in rubbing down the painted surface of iron and steel work, namely (1) the Railway Companies, (2) the Constructional Engineers and (3) General Engineers, Shipbuilders and Iron and Steel Manufacturers. The Railway Companies are concerned with iron and steel work in roofs of railway stations and locomotive sheds, bridges, etc.; the Constructional Engineers in girders, columns, roof trusses, &c., for new buildings, and Engineers generally, Shipbuilders and Iron and Steel Manufacturers in maintenance work in their factories, workshops and plants.

20. Hence Regulation 3 (a) met with serious opposition from these Employers, while the Employers in the Painting and Decorating Trade were prepared to accept it, as were the Operatives represented by the National Amalgamated Society of Operative House and Ship Painters.

21. Mr. Conrad Gribble contended that it was impracticable to carry out the Regulation as drafted in connection with the preliminary work of periodical cleaning and painting for maintenance purposes of constructional iron and steel work in railway stations, locomotive sheds and bridges.^(s)

The evidence showed that the bulk of iron and steel work in roofs of railway stations, locomotive sheds, etc., becomes in the ordinary course largely covered with a deposit of a sooty, greasy mixture.^(t) The cleaning down of such iron and steel work is not like the dry rubbing down of paint applied to ordinary surfaces in the interior and exterior of brick and timber buildings. The cleaning is a more drastic process and consists largely of removing dirt, rust and old paint and in getting down as far as possible to the bare iron and steel.^(u) About 75 per cent. of the work in repainting is taken up with preliminary cleaning and removing dirt.^(v) The surfaces of

^(p) Mr. Gribble, First Day, pp. 95, *et seq.*; Sir G. Bellhouse, Second Day, p. 33; Mr. C. A. G. Linton, *Ibid.*, p. 66; *Cf.* Mr. Batterworth, *Ibid.*, p. 6.

^(q) Mr. Linton, *Ibid.*, p. 70.

^(r) Mr. Conrad Gribble, First Day, p. 93; Mr. R. Carpmael, Second Day, p. 73; Mr. Cunningham, First Day, p. 55.

^(s) Mr. Gribble, *Ibid.*, p. 92.

^(t) Mr. Linton, Second Day, pp. 70, 71.

^(u) Mr. Gribble, First Day, p. 94.

^(v) Mr. Linton, Second Day, p. 70.

iron and steel which have to be repainted need not be smooth surfaces; it is sufficient if they are clean;^(w) they are frequently deeply pitted and corroded, and no ordinary dry or wet rubbing down would apply.^(x)

The preparation of the iron and steel painted surface for repainting in the roofs of railway stations and locomotive sheds, etc., very frequently begins with a chipping hammer. A chipping hammer, scraper and iron brush are used, and by those means as much as possible of the loose dirt, rust and loose paint is removed.^(y) The cleaning of the roofs of railway stations and locomotive sheds, bridges and constructional work is done mostly by chipping and scraping. In chipping, the paint comes off in lumps or cakes.^(z) The process is:—The dust is first brushed off with a soft brush, then the surface is chipped where the paint is badly corroded: “Where the paint is sound we only wire-brush, but where it is in any way encrusted with rust it is chipped with the tail of a file which is turned up and a chipping hammer, and then it is wire-brushed almost bright before the first application of red lead. I am afraid I do not know of any other means whereby you could obtain the absolute cleanliness of the metal with the little pox holes and rust holes which occur.”^(a) The old paint if sound is not taken off when repainting; the surface is brushed over to get off the dust and grease. If a patch of rust is discovered it is cleared out with the chipping hammer and wire brush.^(a) The processes resolve themselves into one of cleaning sound paint and removing loose paint; and there is no other way than chipping and wire-brushing to get the surface clean. Wire brushes are used on surfaces comparatively clean to detect loose blisters of paint. If a bridge is a “building” within the Regulations, and if Regulation 3 (a) stands, no process of cleaning can be carried out on a steel bridge. The actual cleaning of constructional steel work in the ordinary course of maintenance cannot be carried out, except by dry scraping and wire-brushing and no wet cleaning process is applicable.^(b) The same conditions are found in harbours and docks.^(c) The above described processes of cleaning down, etc., “are never attended with any poisonous effects to the people who undertake them.”^(d)

22. Mr. Lamb contended that it was impracticable to carry out Regulation 3 (a) as drafted in connection with constructional engineering.

^(w) Mr. Linton, Second Day, p. 71.

^(x) Mr. Gribble, First Day, p. 94.

^(y) Mr. Gribble, *Ibid.*, p. 94; Mr. Linton, Second Day, pp. 65, *et seq.*

^(z) Mr. Linton, Second Day, p. 72.

^(a) *Ibid.*, p. 65.

^(b) Mr. Gribble, First Day, pp. 95, *et seq.*; Mr. Linton, Second Day, pp. 67, *et seq.*; Mr. Carpmael, *Ibid.*, pp. 73, 74.

^(c) Mr. Gibson Smith, First Day, p. 97.

^(d) Mr. Gribble, *Ibid.*, p. 95.

The evidence showed that units, such as small girders, columns, crane gantry girders, roof trusses etc. for constructional engineers were fabricated in the workshops and temporarily assembled, and it was a practice to paint these sections or units with one coat of paint before they left the workshop. The paint may be red oxide paint, red lead paint, or it may be oxide of iron paint which has no lead; or the steel may be merely oiled or left untreated altogether. On steel, for some time after it has been rolled and even after it has been fabricated, a scale, called a "mill scale," continues to form and does not leave the surface of the steel for some time. This mill scale practically nullifies the value of the first coat of paint put on in the workshop. The constructional engineer removes the mill scale by scraping and brushing the steel. The object is not to rub down or remove the paint but to get rid of the mill scale. Where the scale comes off, it comes off in small flakes; if it does not come off after being scraped roughly and wire-brushed, it is allowed to remain. It is not necessary to have a smooth surface or to get a fine finish. The object of the first coat is an old fashion which has grown up and is specified by engineers.^(e) Mr. Cunningham stated that no "case of proved lead poisoning in connection with such a thing as scraping off this paint" could be traced.^(f)

23. In his evidence Sir Gerald Bellhouse suggested that an exemption might be introduced in Regulation 3 (a), which would exclude the removal of paint from iron and steel by chipping, scraping or brushing with a wire brush, but not rubbing down by sand paper; and expressed the opinion that the health of the worker would not be imperilled by such an amendment.^(g) The dust from wire brushing is coarser and less likely to be inhaled than dust arising from rubbing down with dry sand paper.^(h)

24. In the course of the hearing it transpired that further information of the precise nature of the dust inhaled (if any) by the operative resulting from chipping and rubbing down of painted iron and steel surfaces was advisable, and Mr. Knowles intimated that the Home Office was prepared, should I think it desirable, to have a certain amount of the dust or debris collected and a test made which would possibly give the information and the extent to which the danger (if any) existed.⁽ⁱ⁾ I agreed to this being done.

25. Mr. L. C. McNair and Mr. C. W. Price, Engineering Inspectors in the Factory Department of the Home Office, were accordingly instructed to make investigations, and these were made on the premises of the Southern Railway and the Great Western

^(e) Mr. H. Cunningham, First Day, pp. 51 *et seq.*

^(f) *Ibid.*, p. 55.

^(g) Sir G. Bellhouse, Second Day, pp. 25, 26.

^(h) *Ibid.*, p. 25.

⁽ⁱ⁾ Mr. Knowles, Second Day, p. 40.

Railway. They confined their observations to operations on work for which the dry methods of rubbing down are most commonly used, namely—station roof details and bridge girder work. A copy of their Report is set out in Appendix D. Although it is not exhaustive in that it does not cover the whole range of iron and steel structures, it is a valuable contribution to the study of this vexed question. The tests applied by Mr. McNair and Mr. Price led to the following conclusions:—

(1) Dry wire brushing and other dry processes carried on in the open may be regarded as safe, the total inhalation per day not being likely to be dangerous, save in exceptional circumstances.

(2) In the case of dry wire brushing carried on indoors, the amount of lead inhaled during quite a short spell is likely to exceed the amount which could safely be absorbed daily.

(3) The same applies—though in rather less degree—as regards wire brushing carried on out of doors but under cover (e.g., on the undersides of station roofs); the length of spell which could safely be worked daily would depend upon the condition of the paint.

(4) Chipping and scraping are probably less dangerous than wire brushing. The initial dandy brushing of a dirty surface, if the paint is in bad condition, may be more dangerous.

(5) The use of linseed oil on wire brushing processes does not seem likely to result in a reduction of lead inhalation as compared with the dry method.

(6) The use of turpentine would probably result in such a reduction, but is open to other objections.

If the dry processes of chipping, scraping and wire brushing are to be permitted under cover in future, the question of mitigating the possible effects will require to be considered. Respirators might be worn and, in the case of dandy brushing and possibly other processes, use might be made of portable vacuum cleaning apparatus. The daily time to be spent on the work might be limited or arrangements might be made for periodic medical examination with a view to the suspension of any workers affected.^(j)

26. Mr. McNair and Mr. Price also gave evidence at the Inquiry. In their opinion an objection to the use of turpentine on iron and steel surfaces is that the turpentine runs into crevices and may clean the surface and, when it dries, the surface may rust again before the coat of paint is applied. "If you rub down with oil or turpentine you get this sludge all over the surface and when you come to put on your coat of paint you get a coating underneath of dry . . . oil."^(k) It is important that the paint should

^(j) See Appendix D.

^(k) Mr. McNair, Third Day, p. 10.

go well home in brackets and rivet heads and there would be uncertainty and the rubbing might not take away the rust around the bracket or rivet before the paint is applied, in which case there is a definite seat of corrosion.⁽¹⁾ Wire brushing produces dust,^(m) and, if the old paint is lead paint, the dust will contain lead.⁽ⁿ⁾ No use has yet been made of the vacuum cleaning apparatus.^(o)

The tests taken by Mr. McNair and Mr. Price showed that with linseed oil and turpentine a condition is produced which is the opposite to what is intended. It does not assist in the cleaning of iron or steel work; ^(p) a lubricant is not needed; it prevents the proper cleaning of the surface.^(q) Paraffin or spirit, besides being an agent for the laying of dust, is useful; for example, in the case of a column which has become greasy and the surface is not broken, when the grease may be wiped off with the spirit.^(r) Oil is not practicable, as, if given in excess, it prevents drying and frequently leaves a slimy surface.^(s) A wet process of any kind, whether by water, turpentine or linseed oil, is unsuitable.^(t)

Brig.-Genl. Baylay emphasised the difference between the rubbing down of steel and iron work and that of woodwork. The latter is fine rubbing down to get a very fine and smooth surface painted, and the dry rubbing down creates a very fine dust; the former is to remove the scale and to get down to the steel work where it is rusty, so as to prevent rust.^(u)

27. Mr. Knowles stated that the Home Office approached the question primarily from the point of view of the health of the worker, and that every relevant factor in this connection must be considered; and, if any exemptions are made these considerations should be borne in mind.^(v) The problem of dry rubbing down of lead-painted iron and steel surfaces was really a matter for further consideration. They were not prepared to recommend, for example, that the use of turpentine should be made compulsory. The experience was insufficient to enable the question to be dealt with finally at present. The Home Office suggested that possibly the best course might be to allow the processes to continue for the time being, but that they would seek every opportunity of obtaining further information, and conceivably at some future time the matter would again have to be considered whether it should be made the subject of Regulations. In the meantime,

⁽¹⁾ Mr. Price, Third Day, p. 10.

^(m) *Ibid.*, p. 13.

⁽ⁿ⁾ Messrs. McNair and Price. Report 21st July, 1927, Appendix D.

^(o) Mr. Linton, Third Day, p. 18.

^(p) Mr. Gribble, *Ibid.*, p. 15; Mr. Carpmael, *Ibid.*, p. 16.

^(q) Mr. Gribble, Third Day, p. 15; Mr. Linton, Second Day, p. 66.

^(r) Mr. Turner, Third Day, p. 20.

^(s) Mr. Linton, Second Day, p. 70; Mr. Turner, Third Day, p. 20.

^(t) Mr. Gribble, Third Day, p. 15; Mr. Carpmael, *Ibid.*, p. 16.

^(u) Brig.-Genl. Baylay, *Ibid.*, p. 21.

^(v) Mr. Knowles, Second Day, pp. 23, 24.

by virtue of the Act of 1926, any cases of poisoning will have to be notified under the Factory and Workshop Act, 1901, and under the Regulations (see Appendix A) provision is made for periodic medical examination, which would enable the Home Office to keep watch and ward on the subject.^(w)

28. It appears that when the Regulations now under consideration were originally drafted in 1922 and re-discussed in 1927, the actual position of rubbing down lead-painted surfaces of iron and steel work by dry process was not considered. The evidence adduced at the Inquiry showed the great difficulty, if not impossibility, there was in cleaning and repainting iron and steel construction work in the event of dry rubbing down and scraping being absolutely prohibited. The Geneva Convention excepted from prohibition white lead, &c., where its use was considered necessary for railway stations or industrial establishments by the "competent authority" after consultation with the employers' and workers' organisations concerned. Although, according to the evidence, there is an element of danger in dry rubbing down of lead-painted iron and steel surfaces with a wire brush under cover, apparently no case of lead poisoning has been directly traced to the operations of rubbing down these surfaces. I think, therefore, at least as a tentative measure, the suggestion made by Sir Gerald Bellhouse (see paragraph 23) should be given effect to, and I recommend that Regulation 3 be amended accordingly. Careful watch should at all times be kept to ascertain whether the circumstances warrant the exercise of powers under the Regulations for the periodic medical examination of workmen and for other matters.

The representatives of the railway companies at the Inquiry stated that there were certain suggestions in the Report of Mr. McNair and Mr. Price which would be carefully considered by the companies.^(x)

29. The railway companies did not submit any objections to any of the other Regulations and did not claim exemption from the Regulations generally with regard to the painting of such buildings as hotels, waiting rooms, etc., or of fencing and railings.^(y)

CASUALLY EMPLOYED.

30. In the engineering industry certain of the large firms keep small squads of painters as maintenance men. The number in a squad varies. Some squads have two or three men and some three or four; a few have larger squads up to 12 or 15; the number is generally small. They are more or less regularly employed in painting the firm's premises for maintenance purposes, and the firm do not contract for or execute any painting work outside their

^(w) Mr. Knowles, Third Day, pp. 23 *et seq.*

^(x) Mr. Gribble, *Ibid.*, p. 16; Mr. Carpmael, *Ibid.*, p. 17.

^(y) Mr. Gribble, Second Day, p. 13; Mr. Carpmael, *Ibid.*, p. 74.

own premises. Other engineering firms when they require to paint their buildings put on some of their workmen to do the work. The painting is regarded as rough painting. The men so employed are not trained painters in the sense of having served an apprenticeship, but generally are odd men and labourers. They are not regularly, but casually, occasionally and intermittently engaged in painting. Mr. Lamb contended that men so employed are not exposed day after day to whatever risks there may be in painting. He submitted that the provisions relating to washing, overalls, etc., should not apply to persons so casually employed, and that engineering firms should be excluded from the operation of Regulations 4, 5, 7, 8, 9, and 10.^(z)

31. Mr. Gregorson^(a) took the same view and pointed out that the principle of exempting persons engaged on casual, occasional or intermittent operations had already been accepted in the Vehicle Painting Regulations, 1926, which enact:—

“ Provided that these Regulations shall not apply to (a) a factory or workshop in which not more than two persons are engaged in painting; or (b) the occasional painting of a vehicle used solely in the business of the factory or workshop.”

32. Mr. Boyd^(b) also took the same view, and called attention to the Report for 1925 of the Chief Inspector of Factories, which states at p. 70: “ The number of cases among house-painters and plumbers which came to the knowledge of the Department (notification is not obligatory) was 100 (12 deaths).” Of these, 88 (9 deaths) were house-painters and 12 (3 deaths) were plumbers. “ House-painting, therefore,” the Report continues, “ is shown to be easily first of the occupations giving rise to lead poisoning in this country. Comparison of these with the total cases of lead poisoning contracted in factories (326) shows that among house-painters in 1925 the cases were twice as severe as factory cases, the amount of chronic poisoning was four times as great, and the incidence of the severe symptom of paralysis also was greater.” Mr. Boyd accordingly contended that the draft Regulations were designed to cover the house-painting industry and were inappropriate to the engineering, shipbuilding and iron and steel industries, as lead poisoning occurs ordinarily from the cumulative absorption of lead into the system. There was, thus, he urged, a clear distinction between house-painters and individuals who were casually engaged on painting buildings in other industries. He claimed that the shipbuilding industry should be entirely excluded, or in the alternative that Regulations 4, 5, 7, 8, 9, and 10 should not apply to shipbuilding. No men in the shipbuilding yards are regularly employed

^(z) Mr. Lamb, First Day, pp. 36 *et seq.*: Draft Regulations, Appendix A.

^(a) Mr. Gregorson, First Day, pp. 73 *et seq.*

^(b) Mr. Boyd, *Ibid.*, pp. 78 *et seq.*

in or in connection with the painting of buildings; it is merely a question of a few men occasionally employed.

33. Mr. Butterworth and Mr. Turner submitted that all employers and workpeople ought to be treated alike under the Regulations and no special exemption ought to be given to any one, even if only casually employed.^(c) A painter does not spend half his time in the actual practice of painting, but carries out many other processes, such as distempering, plastering, hanging wallpapers, cleaning, sizing, varnishing and lime washing.^(d) Mr. Harney contended that the power of the Secretary of State is to make Regulations respecting the class of “ persons employed in or in connection with the painting of buildings,” and that there is no power under the Act to make Regulations for one section of the persons employed in or in connection with the painting of buildings and exempting another section.^(e)

34. Sir Gerald Bellhouse thought that so long as only a very small proportion of time was occupied in painting work, some relaxation could be made in the draft Regulations without risk of injury to the health of the workmen.^(f)

35. I have given careful consideration to the evidence and arguments submitted, and have come to the conclusion that the claim for total exclusion from the operation of the Regulations in the shipbuilding industry has not been established, but that where persons are casually, occasionally or intermittently employed a modification of the application of the Regulations may be made, as indicated in the draft Regulations with suggested amendments. (See Proviso to Regulations and Regulation 8 in Appendix E.) The powers of the Secretary of State enable him to make regulations reasonably necessary to meet the circumstances of each case.

FIVE MINUTES FOR WASHING.

36. Exception was taken on behalf of the Engineering and Allied Employers' National Federation, the National Federation of Iron and Steel Manufacturers and the Shipbuilding Employers' Federation to Regulation 4 (b), which provides:—“ Five minutes shall be allowed to each such person for washing before each meal time and before leaving work.” (See Appendix A.)

The main grounds of objection were:—

- (1) Where maintenance men are regularly employed on painting work it would upset the discipline of the factory if they were to have the right to stop five minutes before the

^(c) Mr. Butterworth, First Day, pp. 108, 114; Mr. Turner, *Ibid.*, p. 104.

^(d) Mr. Butterworth, *Ibid.*, p. 108.

^(e) Mr. Harney, Second Day, p. 20.

^(f) Sir G. Bellhouse, *Ibid.*, pp. 26 *et seq.*

usual stopping time, and the other workmen who have no such right will at once slack off.

(2) There is no similar provision in the Vehicle Painting Regulations, and where vehicle painters and maintenance painters are employed in the same factory (as they sometimes are) the proposed Regulation would cause dissatisfaction and unrest.

(3) The proposed Regulation will add to the manufacturing cost of the industry, and where an industry is open to fierce foreign competition, as is the case of the three industries objecting, it is necessary to scrutinise every item of cost and to see that the normal working hours are productive and effective hours. For a workman regularly employed it would mean one hour a week, for which he would expect to be paid.

(4) Such a Regulation would be *ultra vires* in that the provision of five minutes is not necessary to prevent danger to persons employed in or in connection with the painting of buildings.^(g)

37. It was contended *contra* that the granting of a period such as five minutes is common throughout the painting industry, and when painting operatives from the painting industry are employed in engineering, shipbuilding and iron and steel establishments on painting work a period of five minutes or other reasonable time is allowed.^(h)

38. Washing is a duty personal to the workman. I find that in the painting industry proper there are many agreements between the Employers' Association and the Operative Painters' Society granting five minutes or other reasonable time to the operatives to wash before meal time and before the close of the working day, but that there is no similar provision in any of the other industries concerned. The requirement that time shall be allowed by the employer to the workman engaged in lead processes for the purpose of washing is a precautionary measure which has appeared in several codes of Regulations, though not in all the codes which have to deal with lead poisoning. Its object is to ensure the observance of the requirement that the workmen shall wash before taking their meals and on leaving work. The circumstances of the present case are special, and it seems to me best to allow the matter to be dealt by mutual agreement and not by statutory regulation. I, therefore, find that the case for Regulation 4 (b) had not been established and should be omitted from the Regulations. It becomes unnecessary to consider whether the proposed draft Regulation 4 (b) is or is not *ultra vires* the Secretary of State.

^(g) Mr. Lamb, First Day, p. 45; Mr. Gregorson, *Ibid.*, p. 72; Mr. Boyd, *Ibid.*, p. 80.

^(h) Mr. Butterworth, First Day, p. 112; Mr. Turner, Second Day, p. 12.

MACHINERY AS FIXTURES.

39. It was contended on behalf of the Engineering and Allied Employers' National Federation that machinery, which might be regarded as "fixtures," should be excluded from the operation of the Regulations. The Regulations, it was agreed, should be clear and explicit so that employer and workman can easily understand them. By applying the Regulations to "fixtures" which may include productive machinery difficult and complicated questions will arise. The standards for determining whether or not a machine is a fixture vary according to the relationship in respect to which the question arises—whether between heir and executor, landlord and tenant, mortgagee and trustee in bankruptcy or in the matter of rating; moreover, the laws of England and Scotland differ in certain respects. It does not appear what standard will be applied to "fixtures" under the Factory Acts. It should be made clear that "fixtures" for the purpose of the Regulations does not include machinery.⁽ⁱ⁾

Mr. Harney submitted that the Bill originally included "buildings" only, but Parliament extended it to "fixtures," the object being to bring in large machinery which is part of the premises, and that to exclude machinery from the Regulations would tend to defeat the object of the Act.^(j)

40. I agree that the Regulations should if possible avoid questions of legal nicety and difficulty; but it appears that Parliament by amendment introduced "fixtures" into the Bill, and it would be flying in face of Parliament to frame Regulations excluding machinery from the category of fixtures without cogent reason, and none has been shown. There does not appear to be any satisfactory reason on the ground of the health of the worker for differentiating the painting of machinery which may be "fixtures" from the painting of iron and steel girders, roofs of railway stations, etc. I may point out that the amendment I recommend in Regulation 3 as to the painting of iron and steel surfaces will apply equally to any machinery which comes within the category of fixtures.

GENERAL.

41. Regulations 1 (a) and (b) have been recast in order to carry out the objects of the Act more effectively.^(k) Several amendments have been made in some of the Regulations, other than those already specifically mentioned, mostly of a drafting nature.^(k) Doubt was expressed as to the meaning and effect of "prescribed" leaflet in Regulation 7 (a).

By virtue of Section 31 of the Interpretation Act, 1889, expressions used in regulations made under an Act of Parliament have

⁽ⁱ⁾ Mr. Lamb, First Day, pp. 40, 41; Second Day, p. 102.

^(j) Mr. Harney, Second Day, p. 102.

^(k) Sir G. Bellhouse, Second Day, pp. 56 *et seq.*; Mr. C. A. Klein, *Ibid.*, pp. 47 *et seq.*; Mr. Noel Heaton, *Ibid.*, pp. 52 *et seq.*; Brig.-Genl. Baylay, *Ibid.*, p. 54; Mr. Butterworth, *Ibid.*, pp. 44, 57; Mr. Lamb, *Ibid.*, p. 55; Mr. Harney, *Ibid.*, pp. 58 *et seq.*

the same meaning, unless the contrary appears, as in the Act conferring the power to make them (Cf. *Reg. v. Walker* (1875) L.R., 10. Q.B. p. 358). The Act of 1926 (see Section 8), under which the Regulations (now under consideration) are made, is to be construed as one with the Factory and Workshop Acts, 1901 to 1920; and under Section 156 (1) of the Factory and Workshop Act, 1901, "prescribed" means prescribed for the time being by the Secretary of State. "Prescribed" leaflet in Regulation 7 (a) means, therefore, a leaflet prescribed by the Secretary of State.

42. The amended Regulations are set out in Appendix E. In my judgment these Regulations as amended are reasonably practicable to protect the health of persons employed in or in connection with the painting of buildings and are proper for adoption by the Secretary of State.

43. I cannot conclude this Report without recording my appreciation of the great assistance I have received from the Representatives of the Home Office and of the several parties who took part in the Inquiry.

WILLIAM W. MACKENZIE.

29th August, 1927.

APPENDIX A.

(See paragraph 2 of the Report.)

COVERING LETTER AND DRAFT REGULATIONS.

Home Office,
Whitehall,
31st December, 1926.

GENTLEMEN,

Under the Lead Paint (Protection against Poisoning) Act, 1926, which comes into operation on the 1st January, 1927, the Secretary of State is given powers—which he proposes to exercise immediately—to make Regulations for the protection of persons employed in or in connection with the painting of buildings, against the danger from lead paint, and in particular—

- (a) for prohibiting the use of any lead compound except in the form of paste or of paint ready for use;
- (b) for the prevention of danger arising from the application of lead paint in the form of spray;
- (c) for prohibiting dry rubbing down and scraping;
- (d) for providing for the periodical medical examination of persons employed in or in connection with painting with lead paint, and for the suspension from such employment of persons whose health is or appears likely to be injuriously affected thereby;
- (e) for securing that facilities for washing during, and on cessation of, work are afforded to persons employed in or in connection with painting;
- (f) for the use of protective clothing by persons so employed and for preventing clothes left off during work from being soiled by paint; and

(g) for the distribution to persons so employed of instructions with regard to hygienic precautions to be taken.

The terms of the Regulations to be made by the Secretary of State have been discussed at a series of Conferences held between the Home Office and the Painters' and Decorators' Joint Industrial Council of Great Britain (representing the National Federation of Master Painters and Decorators of England and Wales, the National Operative Painters' Society, the Scottish Painters' Society, and the National Federation of Master Painters in Scotland) at which a complete agreement was arrived at. The draft Regulations thus agreed were subsequently communicated to the National Federation of Building Trades Employers of Great Britain and Ireland, who also were prepared to accept them.

The Secretary of State has approved the Regulations agreed by the Conferences, with some minor alterations of drafting and one addition of some importance. The regulation agreed by the Conferences for prohibiting rubbing down or scraping by a dry process proposed simply that *no surface painted with lead paint* should be rubbed down or scraped by a dry process. It was pointed out, however, both in the discussions on the Bill in Parliament and also on behalf of the Master Painters, that a very large percentage of existing painted surfaces will have been painted with a lead coat at some time or another, that the dry rubbing down or scraping of these surfaces will be dangerous, and that it would therefore be reasonable and desirable to lay down that, except where the employer has good reason to the contrary, he should regard every old painted surface as painted with lead paint. The Secretary of State therefore proposes that *no painted surface* shall be rubbed down or scraped by a dry process, except where the employer, after taking all reasonable steps for the purpose, has satisfied himself that the surface is not painted in whole or in part with lead paint.

The question may be asked what reasonable steps are open to an employer to satisfy himself that a painted surface is not painted in whole or in part with lead paint. A rough test of an inexpensive character has been worked out by the Government Chemist which, the Secretary of State thinks, should be of great practical value to employers in this matter. This test, details of which are set out in the notice enclosed herewith, is not a quantitative test, i.e., it will not determine the amount of soluble lead present; it is simply a test for ascertaining whether or not any lead is present in the material. If the employer obtains a negative result with this test, he will be justified in rubbing down or scraping with a dry process. On the other hand, if he obtains a positive result, it will be necessary for him to treat the surface as painted with lead, or if he thinks that the percentage of soluble lead does not exceed the permitted amount, to arrange for a full chemical analysis to be carried out in accordance with the prescribed method.

A copy of the proposed regulations is enclosed for your information, and the Secretary of State trusts that as the present draft regulations are based on an agreed code between the Home Office and the Associations above mentioned, they will be accepted by all concerned. The draft regulations, however, are subject to the procedure laid down in sections 80 and 81 of the Factory and Workshop Act, 1901, and in accordance with the requirements of these sections, he hereby gives notice:—

That he proposes to make Regulations for preventing danger from the use of lead paint to persons employed in painting buildings in accordance with the enclosed draft, copies of which may be obtained on application to the Factory Department, Home Office, London, S.W.1, and that any objection with respect to the draft regulations by or on behalf of any person affected thereby must be sent to the

Secretary of State within 40 days of this date. Every such objection must be in writing and must state (a) the draft Regulations or portions of draft Regulations objected to; (b) the specific grounds of objection; and (c) the omissions, additions or modifications asked for.

I am,
Gentlemen,
Your obedient Servant,
JOHN ANDERSON.

Draft Regulations.

LEAD PAINT (PROTECTION AGAINST POISONING) ACT, 1926.

The Lead Paint Regulations, 1927, made by the Secretary of State under section 1 of the Lead Paint (Protection against Poisoning) Act, 1926 (16 & 17 Geo. 5. c. 37).

In pursuance of Section 1 of the Lead Paint (Protection against Poisoning) Act, 1926, I hereby make the following Regulations for preventing danger from lead paint* to persons employed in or in connection with the painting of buildings.†

These Regulations may be cited as the Lead Paint Regulations, 1927, and shall come into force on 1927.

Duties.

It shall be the duty of all persons who employ persons in or in connection with the painting of buildings to observe Part I of these Regulations.

It shall be the duty of all persons employed in or in connection with the painting of buildings to observe Part II of these Regulations.

PART I.

Duties of Employers.

1.—(a) White lead, sulphate of lead or products containing these pigments shall not be used or procured for use for the painting of buildings except in the form of paste or of paint ready for use.

(b) Lead paint shall not be stored, or transported, otherwise than in receptacles legibly marked as containing lead paint. But this provision shall not apply to receptacles (i) for preparing paint for immediate application, (ii) for actual use in painting.

2. Lead paint shall not be applied in the form of spray in interior painting of buildings.

3.—(a) No painted surface shall be rubbed down or scraped by a dry process.

(b) All débris produced by rubbing down or scraping of any such surface shall be removed before it becomes dry.

(c) The foregoing requirements shall not apply in any case where the employer after taking all reasonable steps for the purpose has satisfied himself that the surface is not painted with lead paint in whole or in part.

4.—(a) There shall be provided for the use of persons employed in or in connection with the painting of buildings and liable to come into contact with lead paint a sufficient supply of water, soap, nail brushes and towels and at least one bucket or basin for every five persons so employed.

(b) Five minutes shall be allowed to each such person for washing before each meal-time and before leaving work.

5. Suitable arrangements shall be made to prevent clothing put off during working hours being soiled by lead paint. Where practicable the

* "Lead paint" means any paint, paste, spray, stopping, filling, or other material used in painting which, when treated in a manner prescribed by rules made by the Secretary of State, yields to an aqueous solution of hydrochloric acid, a quantity of soluble lead compound exceeding, when calculated as lead monoxide, five per cent. of the dry weight of the portion taken for analysis—see Section 7 of the Act.

† By Section 7 of the Act, the expression "building" includes "fixtures."

accommodation so provided shall be outside any apartment in which painting is being carried on.

6. Where the Chief Inspector of Factories gives notice to an employer that the incidence of lead poisoning among the persons employed by him in or in connection with the painting of buildings with lead paint is excessive, such employer shall make arrangements for the periodic medical examination of all persons so employed by him and for the suspension from such employment of any of such persons whose health is or appears likely to be injuriously affected thereby, in accordance with such conditions as the Chief Inspector of Factories may prescribe.

7.—(a) The employer shall give to each person employed by him in or in connection with the painting of buildings when he is engaged, and subsequently on the first pay day in each year, a copy of the prescribed leaflet containing special health instructions as to the use of paint.

(b) A printed copy of these regulations shall be posted in the workshop, paint store, and in any apartment in which the paints are mixed, on all jobs on which more than 12 men are employed in painting operations.

Part II.—Duties of Persons Employed.

8. Overalls shall be worn during the whole of the working period by every person employed in or in connection with the painting of buildings and liable to come into contact with lead paint, and shall be washed at least once a week.

9. Every person employed in or in connection with the painting of buildings shall deposit his clothing put off during working hours so as to prevent it being soiled by lead paint, and for this purpose shall as far as practicable make use of the accommodation provided in pursuance of Regulation 5.

10. Every person employed in or in connection with the painting of buildings and liable to come into contact with lead paint shall carefully clean and wash his hands before each meal-time and before leaving work.

11. Every person employed in or in connection with the painting of buildings and liable to come into contact with lead paint shall present himself at the appointed time for medical examination when so required by Regulation 6.

One of His Majesty's Principal Secretaries of State.

Home Office, Whitehall.
1927.

APPENDIX B.

(See paragraph 3 of Report.)

LIST OF OBJECTORS.

1. Messrs. J. H. Huddleston & Sons, painters and decorators, 17, Charlotte Street, Melton Mowbray.
2. Mr. H. L. Greengrass, painter and decorator, 64, Bridge Street, Stowmarket.
3. Mr. John Bryan, builder and decorator, Rose Place, Bidford-on-Avon, Warwickshire.
4. Messrs. Hyder & Sons, builders and decorators, Shipbourne, Tonbridge, Kent.
5. The National Federation of Building Trades Employers of Great Britain and Ireland, 48, Bedford Square, London, W.C.1.
6. The Painters' and Decorators' Joint Industrial Council of Great Britain, 9, Albert Square, Manchester.

7. The National Federation of Master Painters in Scotland, 257, West George Street, Glasgow.

8. Mr. Henry Naish, decorator, 14 and 18, St. Mary's Street, Wallingford, Berks.

9. The National Federation of Associated Paint, Colour & Varnish Manufacturers of the United Kingdom, 8, St. Martin's Place, Trafalgar Square, London, W.C.1.

10. The Scottish Association of Bridge-Builders & Structural Engineers, Fyfe Chambers, 105, West George Street, Glasgow.

11. The Dock & Harbour Authorities' Association, 13, Victoria Street, London, S.W.1.

12. The Engineering & Allied Employers' National Federation, Broadway House, Tothill Street, Westminster, London, S.W.1.

13. The White Lead Makers' Section of the London Chamber of Commerce, Messrs. White & Leonard, Solicitors, Bank Buildings, Ludgate Circus, London, E.C.4.

14. The Shipbuilding Employers' Federation, 9, Victoria Street, Westminster, London, S.W.1.

15. The National Federation of Iron & Steel Manufacturers, Caxton House (East), Tothill Street, Westminster, London, S.W.1.

16. The Southern Railway Company and the London, Midland & Scottish Railway Company, General Manager's Office, Waterloo Station, London, S.E.1.

APPENDIX C.

(See paragraph 5 of Report.)

LIST OF APPEARANCES.

Mr. Charles Matthew Knowles, LL.B., (instructed by the Treasury Solicitor, Law Courts, 705, Royal Courts of Justice, London, W.C.2) appeared for the Home Office.

The Honourable E. A. Harney, K.C. (instructed by Messrs White & Leonard, Solicitors) appeared for the White Lead Makers' Section of the London Chamber of Commerce.

Mrs. Elizabeth Abbott appeared for the Home and Women Decorators.

Mr. A. G. White, Secretary, and Mr. Loasby, decorator, London, appeared for the National Federation of Building Trades' Employers of Great Britain and Ireland.

Mr. John B. P. Dobie, Mr. William Mellor, Secretary, Mr. James Edward Butterworth and Mr. J. H. McDermid appeared for the Painters' and Decorators' Joint Industrial Council of Great Britain.

Mr. Turner and Mr. J. A. Gibson appeared for the above-named Council and the National Amalgamated Society of Operative House and Ship Painters.

Mr. John B. P. Dobie appeared for the National Federation of Master Painters in Scotland.

Mr. J. Dudley Sherwood appeared for the National Federation of Associated Paint, Colour and Varnish Manufacturers of the United Kingdom.

Mr. Harry Cunningham appeared for the Scottish Association of Bridge-builders and Structural Engineers.

Mr. W. Ashby Cummins appeared for the Dock and Harbour Authorities' Association.

Mr. A. Gibson Smith appeared for the Mersey Docks and Harbour Board.

Mr. F. D. Lamb, Brig.-Genl. A. C. Baylay, D.S.O. and Mr. Harry Cunningham appeared for the Engineering and Allied Employers' National Federation.

Mr. John A. Gregorson and Mr. John A. Thornton appeared for the National Federation of Iron and Steel Manufacturers.

Mr. John S. Boyd and Mr. George G. Parker appeared for the Shipbuilding Employers' Federation.

Mr. Conrad Gribble and Mr. C. A. G. Linton appeared for the Southern Railway.

Mr. R. Carpmael appeared for the Great Western Railway.

Mr. A. Andrews appeared for the National Federation of Master Painters and Decorators of England and Wales.

APPENDIX D.

(See paragraph 25 of Report.)

Report of Mr. L. C. McNair and Mr. C. W. Price (H.M. Engineering Inspectors of Factories) on effect of rubbing down and scraping by dry process of lead painted surfaces of Iron and Steel Structures.

Home Office,
Whitehall.

21st July, 1927.

To H.M. Chief Inspector of Factories.

SIR,

At the Inquiry into the Draft Lead Paint Regulations held before the Commissioner on the 22nd and 23rd June, the effect of Regulation 3 (a), if applied to the usual dry processes adopted in preparing iron and steel work for re-painting, was raised by the representative of the Railway Companies, who are particularly concerned with the matter as regards such work as station (and bridge) painting. They ask that the processes they employ should be exempted from the proposed prohibition of dry methods. Other interests, such as the erectors of steel framings for new buildings, are also concerned, though to a less extent, and they desire similar exemption. The precise processes adopted depend to some extent on the state of decay of the paint and on the condition of the metal surface, but in any case metal tools, such as chipping hammers, scrapers and wire brushes are required.

Regulation 3 (a) was originally drafted for the purpose of prohibiting the dry sandpapering of painted wood and other non-metal surfaces and its possible application to the dry processes used on iron and steel work had not been specifically considered. Such sandpapering cannot be applied to perished paint on iron and steel work and it was generally agreed that water could not be used on iron and steel—as in the wet rubbing down of painted woodwork—in view of the great risk of increasing corrosion. Mr. Butterworth, representing the Master Painters and Decorators, contended, however, that turpentine might be used to suppress dust and said this liquid was, in fact, adopted at times by Master Painters for some classes of metal work.

In your evidence at the Inquiry, when dealing with the danger from the dry processes applied to iron and steel work, you expressed the opinion that probably there was little or no danger, as most of the paint would be gone, what was left being chiefly rust; and also the dust produced would not be nearly so fine as that produced by the sandpapering. You made it clear, however, that you had no scientific information on which an expert opinion could be based and finally Mr. Knowles offered, on behalf of the Home Office, to have a certain amount of the dust collected and tested. The Commissioner agreed that this would be very useful and the railway companies offered every assistance.

In these circumstances and in accordance with your instructions, we have carried out a series of observations to determine the lead content in the air inhaled by workers when engaged on the dry processes of chipping, scraping and wire brushing lead-painted iron and steel work. Throughout each

observation the air was aspirated from points close to the worker's mouth and passed through a bottle containing the necessary filtering material for collecting the dust. The samples so obtained and also samples of the paint scrapings were subsequently examined by the Government Chemist, and his results are given in Tables I (Col. 8) and II of this Report.

We did not make any tests in connection with the dry processes applied to the painted surfaces of newly erected iron or steel work which, as described by Mr. Cunningham at the Inquiry, is often roughly painted before being sent on to the job, and before re-painting thoroughly wire brushed in order to remove the mill-scale which forms under the paint. This work, most of which is done in the open, must be less dangerous than the corresponding work on the railways as the dust produced is not likely to be so fine and the workers are much less frequently employed in this way.

In view of the statement made by Mr. Butterworth at the Inquiry, we asked him whether he desired to suggest, for the purposes of our tests, any examples of iron or steel work upon which the turpentine method was being used, but he said that he did not think this was necessary. The Trade would be perfectly willing to accept the results of the tests to be made on railway premises, and the effect of using turpentine could, he thought, be determined in the course of these tests.

All our observations were conducted on the premises of the Southern and Great Western Railway Companies, whose officials have afforded us every assistance and to whom we desire to express our thanks. It proved a somewhat difficult matter to arrange for these observations as iron and steel details do not, as a rule, present such large surfaces as are often available on wood, stone or plaster structures. The lead-painted surfaces provided for the indoor experiments were less extensive than those for the outdoor. In each case the brushing or other process was performed by one man only, but always under practical conditions.

We confined our attention to the class of work for which the dry methods referred to above are most commonly used, e.g., station roof details and bridge girder work. Owing to the specially severe conditions to which this class of work is exposed, we think that it presents—as compared with other classes, such as railings, etc.—the maximum degree of danger.

Observations were made of indoor and outdoor work and of work done on the metal parts on the underside of a station roof. Workers engaged on such a roof are more exposed to dust than those working entirely in the open air, but less so than those engaged indoors, owing to the greater air movement. The conditions as to dust inhalation for those working out of doors must depend on the position a man can take up relatively to the direction of the wind.

All the surfaces were known to have been lead-painted throughout, i.e., with lead in each coat; the priming coat in each case consisted of red lead made up with linseed oil. The presence of lead in the paint was confirmed in each case by analyses of the debris resulting from chipping or scraping the surfaces. (Table II.)

The period of time since the surfaces were last painted varied very considerably, but in no case was it less than three years. The condition of the paint films was also widely different; some showed little deterioration, the paint being in good firm condition. In all cases, however, wire brushing gave rise to dust which contained lead; this disposes of the contention, sometimes advanced, that wire brushing a lead-painted surface of iron or steel work will not produce lead dust if the paint is in good condition. Some of the surfaces showed marked deterioration, particularly so in the case of the girder dealt with in the outdoor experiments. The paint in this case was very blistered, and, in places, there was extensive corrosion of the metal.

Our samples include some taken during the wire brushing of surfaces which had been previously painted over with turpentine or linseed oil. The use of these liquids appeared to suppress visible dust, but a spray must

be produced, for lead was found in several of the samples. Various objections to such preliminary treatment were suggested by the officials and workers with whom we discussed the matter, and, while it has to be taken into account that they had no previous experience of using such preventive measures, some of their objections appeared to us to have considerable force.

(1) A worker using turpentine is liable to be sprayed with a mixture of turpentine and dust, particularly if he dips his brush in the turpentine. This would be dangerous from the point of view of fire and the stains when dry would give rise to dust containing lead.

(2) Where the surface was overhead, the turpentine would run down the worker's arm and render his clothing wet and uncomfortable. The risk of fire would be increased and there would also be a danger of dermatitis.

(3) In confined spaces, the turpentine vapour would be very unpleasant.

(4) Wire brushing, which is very arduous, would be rendered more difficult, particularly with linseed oil, owing to the slipping of the brush. Oil or turpentine produces a thin coating of sludge which forms in blotches on the surface. It would not be possible, when this coating is present, to make sure that all rust is removed. If the coating was brushed off when dry, dust would arise.

(5) The turpentine or oil would run into crevices below rivet heads, brackets, &c., so preventing satisfactory brushing and painting and resulting subsequently in more rapid corrosion.

(6) Much additional expense would be entailed by reason of the large quantities of expensive oil or spirit required.

One of the samples collected at the station roof was obtained during the first brushing away of the dust from the surface with a dandy brush constructed of bristles. This brushing is always necessary. The sample was found to contain lead. (Observation 8). Such a process might conceivably be considered "rubbing down" within the meaning of No. 3 (a) of the Draft Regulations, but it is difficult to see how it could be done other than by a dry process, having regard to the depth of dust which sometimes collects on these surfaces.

After we had begun our observations we discovered that pneumatically operated portable mechanical chipping and wire brushing tools are being experimented with for the work of preparing some classes of painted iron and steel surfaces for re-painting. They appear likely to be effective but hand work will still be necessary in some situations. These portable tools are operated dry and the men using them would be exposed to dust. We are not in a position to say whether the use of these tools will increase or reduce the danger, but we think that any regulation with regard to hand chipping or brushing should apply equally to these tools.

Table I gives particulars of the processes covered by the observations, the surfaces treated and the total amounts of lead in the aspirated dust samples.

Table II, which gives the percentage of lead in the scrapings taken from the surfaces, shows also the percentage of soluble lead, found by submitting samples of the scrapings (without removing the vehicle) to the action of dilute hydrochloric acid of the strength used for the Home Office Solubility Test (0.25 per cent. by weight of hydrochloric acid). It will be seen that the soluble lead in the scrapings is much less than the total lead, showing that a portion of the lead was protected by the dried vehicle from the action of the acid.

We have not, however, made proportional deductions for possible insolubility from the figures in Columns 9 and 10 of Table I, which are based on the total lead contents of the dust samples. The finely divided condition of the particles in these samples may have rendered their lead content more soluble than that of the scrapings. A solubility test could not be applied to the dust samples and we can only say that part of the lead present in the dust is likely to be protected to some extent by the vehicle and so rendered insoluble and therefore not dangerous.

TABLE I.
Indoor.

No. of Observation.	Sample.		Process.	Surface.			Lead Content in Dust, milligrammes of lead.			Remarks.
	Distinctive Mark.	Volume of Air aspirated (litres).		Years since last painted.	Description.	Condition of Paint Film, &c.	In filter.	In 10 cubic metres of air.	In air inhaled per hour.	
1	6	8.17	Wire brushing	3	(a) Rolled Steel Joist lying horizontally below breathing level (5' 6" x 1' 6" x 7" flange).	Generally good, but some small rusty areas from which paint had disappeared particularly on flanges of (a).	0.15	184*	9.4	Visible dust clouds produced. The cloud in the case of the vertical surface appeared to be wafted away from the worker, but that produced at the horizontal flange remained and did not readily settle. The light colour of surface produced by the brushing was indicative of white lead produced by atmospheric action on the red lead.
				4	(b) Smoke trough placed vertically part above and part below breathing level (7' 6" x 2' 6").					
2	1	11.46	Wire brushing (repeated on same surfaces but more vigorously).	4	"	See Observation 1	0.11	96*	4.9	Visible dust clouds again produced but less dense than in Observation 1. Brushing time noted as 2 minutes 40 seconds.
3	4	1.7	Wire brushing (repeated on (b) after wetting with turpentine).	4	See (b) above ...	See Observations 1 and 2.	Nil.	Nil.	Nil.	No visible dust cloud, but spray of turpentine produced containing, no doubt, particles of paint.

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Outdoor.

4	10	17.6	Chipping (with painter's hammer).	Many	Part of plated web of girder about 7 feet deep.	Paint film much deteriorated, with large blisters, standing off from surface in many places.	0.01	5.7	0.29	The paint film was completely chipped over the entire area selected. Operation took 4½ minutes.
5	42	17.6	Wire brushing	Many	Part of above estimated as 10½ square feet, including chipped portion.	Do.	Nil.	Nil.	Nil.	Visible dust cloud near surface.
6	2	17.6	Wire brushing after 'painting' over with linseed oil.	Many	New area of above not previously treated.	Paint film in much better condition than above with very few blisters.	0.02	11.4	0.58	
7	29	17.6	Wire brushing after 'painting' over with turpentine.	Many	Part of area, dry brushed in Observation 5 of similar extent to that treated in Observation 6.	See Observation 5.	Nil.	Nil.	Nil.	

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Observations 1 to 3 were made in lofty workshop. The condition of surface did not call for preliminary dusting or scraping, except at few places. No observations were made during this scraping, the extent of which was too restricted for sampling. Observations 4 to 7 were made on the sheltered side of the girder. A stiff breeze was blowing from the other side. The worker, a painter of long experience, stood well back and showed much intelligence in so placing himself as to avoid the dust clouds.

* These results may be compared with those obtained in the indoor experiments by Mr. G. E. Duckering on the sandpapering of vehicles and parts of vehicles (See Appendix XIII, Vol. III, of the Reports of the Departmental Committees on House and Coach painting—Cmd. 621, 1920).

TABLE I.—*cont.*
Underside of Station Roof.

No. of Observation.	Sample.		Process.	Surface.			Lead Content in Dust, milligrammes of lead.			Remarks.
	Distinctive mark.	Volume of Air aspirated (litres).		Years since last painted.	Description.	Condition of Paint Film, etc.	In Filter.	In 10 cubic metres of air.	In air inhaled per hour.	
8	16	6.4	Brushing with dandy bristle brush.	Many	Flange of longitudinal horizontal I beam supporting roof details.	Paint film much decayed with many rusty places.	0.04	62.5	3.2	The top flange was covered with a heavy deposit of dirt which was brushed away with the dandy brush. This is extremely unpleasant work.
9	45	12.3	Scraping ...	Many	" " "	See Obs. 8 ...	0.02	16.3	0.83	Preliminary scraping not necessary.
10	52	12.3	Wire Brushing	Many	" " "	See Obs. 8 ...	0.05	40.7	2.1	
11	49	12.3	Wire Brushing	Many	Web of above " ...	Paint film in much better condition than that on flange.	0.02	16.3	0.83	
12	50	12.3	Wire Brushing after painting over with linseed oil.	Many	Web of transverse horizontal I beam of roof.	Paint film in similar condition to that of Obs. 11.	0.02	16.3	0.83	

TABLE II.

Painted surface from which sample was scraped.	Lead percentage (Calculated as lead Monoxide).		Percentage of soluble to total lead.	Remarks.
	Total.	Soluble in dilute Hcl.		
Rolled Steel Joist ...	31·8	13·1	41·2	See Table 1, Observations 1 and 2.
Smoke Trough ...	56·4	29·0	51·4	See Table 1, Observations 1 to 3.
Plated Web of Girder ...	40·3	22·0	54·6	See Table 1, Observations 4 to 7.
I beam supporting Station Roof.	49·2	30·6	62·2	See Table 1, Observations 8 to 11.

According to Sir Thomas Legge:—

“Somewhere about 2 milligrammes of lead is the lowest daily dose which, inhaled as fume or dust, may, in the course of years, set up chronic plumbism. Probably, if the air breathed contains less than 5 milligrammes per 10 cubic metres of air, cases of encephalopathy would never, and cases of colic, very rarely, occur.”

In comparing these standards with the figures given in columns 9 and 10, it must be remembered that in our figures we have made no allowance for the possible inclusion of non-soluble lead in our dust samples. Bearing this in mind and having regard to the fact that the processes are not carried on by any means continuously throughout the day, we suggest that our experiments lead to the following conclusions:—

(1) Dry wire brushing and other dry processes carried on in the open may be regarded as safe, the total inhalation per day not being likely to be dangerous, save in exceptional circumstances.

(2) In the case of dry wire brushing carried on indoors, the amount of lead inhaled during quite a short spell is likely to exceed the amount which could safely be absorbed daily.

(3) The same applies—though in rather less degree—as regards wire brushing carried on out of doors but under cover (e.g., on the undersides of station roofs); the length of spell which could safely be worked daily would depend upon the condition of the paint.

(4) Chipping and scraping are probably less dangerous than wire brushing. The initial dandy brushing of a dirty surface, if the paint is in bad condition, may be more dangerous (Obs. 8).

(5) The use of linseed oil on wire brushing processes does not seem likely to result in a reduction of lead inhalation as compared with the dry method (cf. Obs. 5 with 6 and 11 with 12).

(6) The use of turpentine would probably result in such a reduction (Obs. 3 and 7), but is open to other objections.

If the dry processes of chipping, scraping and wire brushing are to be permitted under cover in future, the question of mitigating the possible effects will require to be considered. Respirators might be worn and, in the case of dandy brushing and possibly other processes, use might be made of portable vacuum cleaning apparatus. The daily time to be spent on the work might be limited or arrangements might be made for periodic medical examination with a view to the suspension of any workers affected. The proposed Regulations, of course, include a provision (No. 6) giving you

power to require periodic medical examination of the workers in cases where the incidence of lead poisoning is excessive and to secure where necessary the suspension of individual workers from work in connection with lead paint.

We are, Sir,
Your obedient Servants,

L. C. McNAIR,
CHAS. W. PRICE.

APPENDIX E.

(See paragraph 42 of Report.)

AMENDED REGULATIONS.

LEAD PAINT (PROTECTION AGAINST POISONING) ACT, 1926.

The Lead Paint Regulations, 1927, made by the Secretary of State under Section I of the Lead Paint (Protection against Poisoning) Act, 1926 (16 and 17 Geo. 5. c. 37).

In pursuance of Section I of the Lead Paint (Protection against Poisoning) Act, 1926, I hereby make the following Regulations for preventing danger from lead paint* to persons employed in or in connection with the painting of buildings.†

Provided that Regulations 4, 5, 7, 9, 11 and 12 shall not apply to persons who are occasionally employed in or in connection with the painting of buildings for an aggregate period not exceeding 26 normal working days in a calendar year and whose ordinary employment does not include the painting of buildings.

These Regulations may be cited as the Lead Paint Regulations, 1927, and shall come into force on _____, 1927.

DUTIES.

It shall be the duty of all persons who employ persons in or in connection with the painting of buildings to observe Part I of these Regulations.

It shall be the duty of all persons employed in or in connection with the painting of buildings to observe Part II of these Regulations.

PART I.

Duties of Employers.

1.—(a) Lead paint shall not be used or procured for use for the painting of buildings except in the form of paste or of paint ready for use. Provided that red lead may be procured for use and used in the raw or dry state to such extent as may be necessary for preparing stopping or filling material and for no other purpose.

(b) Lead paint for use in painting of buildings shall not be procured or stored, whether at the employer's premises or at any place where painting

* "Lead Paint" means any paint, paste, spray, stopping, filling, or other material used in painting which, when treated in a manner prescribed by rules made by the Secretary of State, yields to an aqueous solution of hydrochloric acid, a quantity of soluble lead compound exceeding, when calculated as lead monoxide, five per cent. of the dry weight of the portion taken for analysis—see Section 7 of the Act.

† By Section 7 of the Act, the expression "building" includes "fixtures."

is being done, otherwise than in receptacles legibly marked as containing lead.

2. Lead paint shall not be applied in the form of spray in the interior painting of buildings.

3.—(a) No painted surface other than that of iron or steel work shall be rubbed down or scraped by a dry process.

(b) No painted surface of iron or steel work shall be rubbed down or scraped by a dry sand-papering process.

(c) All débris produced by rubbing down or scraping of any painted surface shall be removed before it becomes dry.

(d) No contravention of the foregoing provisions shall be deemed to have taken place in respect of any painted surface, if the employer proves that such painted surface contained no lead paint.

4. There shall be provided for the use of persons employed in or in connection with the painting of buildings and liable to come into contact with lead paint a sufficient supply of water, soap, nail brushes and towels and at least one bucket or basin for every five persons so employed.

5. Suitable arrangements shall be made to prevent clothing taken off during working hours by persons employed in or in connection with the painting of buildings, being soiled by lead paint. Where practicable the accommodation so provided shall be outside any apartment in which painting is being carried on.

6. Where the Chief Inspector of Factories is satisfied that the incidence of lead poisoning among the persons employed by any employer in or in connection with the painting of buildings with lead paint is excessive, he shall give notice thereof in writing to such employer, and such employer shall forthwith make arrangements for the periodic medical examination of all persons so employed by him and for the suspension from employment in or in connection with painting with lead paint of such persons whose health is or appears likely to be injuriously affected thereby, in accordance with such conditions as the Chief Inspector of Factories may prescribe.

7. (a) The employer shall give to each person employed by him in or in connection with the painting of buildings when he is engaged, and subsequently if still employed as aforesaid, on the first pay-day in each calendar year, a copy of the prescribed leaflet containing special health instructions as to the use of paint.

(b) A printed copy of these Regulations shall be posted in the workshop and paint store, and, on all jobs on which more than 12 persons are employed in painting operations, in any apartment in which the paints are mixed.

8. Where any person, whose ordinary employment does not include the painting of buildings, is occasionally employed in or in connection with the painting of buildings, the employer shall keep a record of the periods with dates during which such person is so employed by him, and such record shall be open at all reasonable times to the inspection of H.M. Inspector of Factories.

For the purposes of these Regulations, the employment of such person as aforesaid for a period of less than half of a normal working day shall be deemed to be half-a-day and of less than a whole normal working day, but more than half-a-day shall be deemed to be a whole day.

PART II.

Duties of Persons Employed.

9. Overalls shall be worn during the whole of the working period by every person employed in or in connection with the painting of buildings and liable to come into contact with lead paint, and shall be washed at least once a week. They shall not be worn at meal times.

10. Every person employed in rubbing down or scraping any painted surface shall carry on his work in accordance with the requirements of Regulation 3 hereof.

11. Every person employed in or in connection with the painting of buildings shall so deposit his clothing taken off during working hours as to prevent it being soiled by lead paint, and for this purpose shall, as far as practicable, make use of the accommodation provided in pursuance of Regulation 5 hereof.

12. Every person employed in or in connection with the painting of buildings and liable to come into contact with lead paint shall carefully clean and wash his hands before partaking of food or leaving the premises.

13. Every person employed in or in connection with the painting of buildings and liable to come into contact with lead paint shall present himself at the appointed time for medical examination when so required in accordance with Regulation 6.