to become a substantial part of this return circuit are inadequate for the protection of the pipes and are frequently dangerous. Such connections greatly increase current flow on pipes, and, while they may afford local protection, they generally distribute electrolysis troubles to other localities where they are more difficult to find, and in this way frequently give a false impression of immunity. Metallic connections from water pipes to the railway return circuit should generally not be permitted and in no case unless a careful study of conditions has shown that no serious danger will be produced. Such connections should never be applied to an underground piping system as the principal means of electrolysis mitigation.

In view of the fact that the railway companies in common with the pipe-owning companies are public utilities operating under public franchises and utilizing city streets, it is the duty of both of these utilities to co-operate in order that the causes and extent of any danger from stray currents can be more readily ascertained. Further, the satisfactory solution of the electrolysis problem is one which requires the co-operation of all of the interests concerned. I think that in the past the red flag has been waved too much, and some owners of underground properties have made unreasonable demands, with the result that the electric railway companies have been afraid to co-operate for fear that they would be asked to make excessive expenditures. There is no real reason for this. Electrolysis is an engineering problem, and can be handled by engineering methods in such a manner that no hardship need be imposed nor should be imposed on any one. There is no reason why the negative feeder system should not be laid out along the same engineering lines as the positive feeder system. I think that if the electric railway companies would realize this and the owners of underground properties would co-operate in a practical way, we could obtain a satisfactory and practical solution of the electrolysis problem. For instance, it often happens that the judicious installation of a few insulating joints will save a lot of money in railway track feeders, and in such cases such joints should be installed.

A most important step towards securing the co-operation, which is absolutely necessary in order to obtain adequate and permanent relief from electrolysis, has been made by the formation of the American Committee on Electrolysis. This committee includes representatives of the electric railway, water, gas, electric light, and telephone interests. This committee was organized in 1913 and has completed a preliminary report setting forth the facts regarding electrolysis, upon which the representatives of all of the varied interests have agreed. The committee has already accomplished a great deal towards producing a closer co-operation between the interests owning the electric railways and those owning the underground structures, and it is to be hoped that the future work of this committee will result in the unanimous adoption of recommendations which will reasonably safeguard underground piping systems against electrolysis.

The discovery of platinum in Alaska by Dr. Herschel C. Parker, of New York, and others, has aroused government agencies to the greatest activity in the hope of finding sufficient quantities of the metal to meet the war needs of the allies. Four government experts have been assigned to study the Alaskan situation and report if the discoveries may replenish the platinum supply cut off recently by the virtual cessation of activities in the Ural Mountain mines, the source of the world's greatest supply.

NOTES ON PREPARED PAINTS FOR METAL SURFACES.*

By Henry A. Gardner,
Assistant Director the Institution of Internal Research, Inc., Washington, D.C.

IN designing protective coatings for metal the modern practice has been to apply the results available from researches into the cause of corrosion. These results have shown that materials of a basic nature or substances which contain soluble chromates prevent the rusting of iron. For this reason pigments of a basic nature or pigments containing the chromate radical have come into wide use in the manufacture of protective paints. That they are the best pigments for this purpose has been proved not only in practice, but also in the Atlantic City tests, which were made upon a series of three hundred large steel panels, using nearly one hundred different pigment paints. Applying the results of these tests to the practical manufacture of protective coatings, the writer will discuss the use of the various pigments under separate headings, taking up the composition of the most widely used colors for metal painting, namely, red, gray, black and green. Most of the paints outlined herewith are suitable for the painting of structural steel, bridges, steel railroad cars and equipment, ornamental ironwork, poles, posts and for general work on metal surfaces.

Red Lead Priming Paints

Red lead may be purchased in the market ground to a heavy paste in linseed oil, ready to thin with oil for use. Such red lead is usually produced by the thorough oxidation or overburning of lead, the dry pigment generally containing approximately 98% of lead tetroxide. This pigment, being practically free from litharge, does not react to any great extent upon the linseed oil in which it is ground, and therefore remains soft for a considerable

Pigment Paints of Ten Highest Average Ratings, 1910-1914.

	1910.	1911.	1912.	1913.	1914.
Basic chromate of lead	9.1	10.0	9.9	9.8	7.5
Sublimed blue lead....	9.6	8.8	9.0	7.2	6.0
Carbon black and barytes	..	..	..	6.8	5.0
Chrome green	9.8	9.8	8.6	7.6	5.0
Willow charcoal	..	8.8	8.6	7.9	4.5
Red lead	..	..	8.1	..	4.0
Natural graphite, containing clay, etc....	..	..	..	..	4.0
Zinc chromate	9.4	9.5	8.8	8.0	4.0
Zinc-and-lead chromate	9.5	9.7	9.2	8.3	4.0
Magnetic black oxide..	9.5	9.5	8.6	7.8	4.0
Zinc-and-barium chromate	9.7	9.5	8.5	7.8	..
Sublimed white lead...	9.5	9.0	8.1	..	..
Bright red oxide	9.3	..	..	..	..
Prussian blue (water stim.)	9.2	..	..	6.7	..
Prussian blue (water inhib.)	..	8.5	..	..	..

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