

managing the furnaces, even of those employed in the numerous steam vessels under my own control. When to this is added the "indisposition of practical men" (the makers of boilers and furnaces) to depart from the beaten track, it can no longer be a matter of surprise that so little has been done in "perfecting the combustion of fuel." The mere stokers, and particularly in steam vessels, where they must necessarily be left to themselves, have it in their power to give apparent favorable results to their own modes and mismanagement, and plausibly to show them none other can supply the engine with the necessary quantity of pressure of steam.

Conclusion 11. "That great facility in the prevention of smoke would be afforded by the publications and descriptions of patented and other inventions for the prevention of smoke, by which those interested could be informed what they could and could not do in this matter, without infringing upon any patent right."

This is as impractical and useless a conclusion as the preceding one is practical and effective. Nothing, indeed, could be more certain of leading the public astray than the descriptions of even the patentees of their own respective plans. On this head more will be said hereafter.

Conclusion 12. "That great facility would also be afforded by the appointment of officers, specially qualified, and not connected with any patentee or manufacturer of boilers or furnaces, to superintend the police officers employed to suppress the nuisance of smoke, and to advise owners of furnaces how best to comply with the provisions of the law, and to report upon cases of its infringement."

This is a valuable suggestion. The difficulty, however, of carrying it out would, it is feared, be too great to render it generally available. The magistrate, in the discharge of his duty, is often unequal to the task of even appreciating the worth or truthfulness of the statements of the offending party; much less is he capable of offering advice, or suggesting a remedy, whether chemical or practical. The Admiralty Judge finds it necessary to have nautical men, as aids, or assessors, before he is qualified to decide on nautical distinctions. The civil judge, on the trial of offences in smoke-nuisance cases, should, in like manner, have an assessor; but he should be a chemical professor, seeing that the offence is as attributable to a breach of chemical laws or practice, as much as the improper steering a ship or mismanagement of sails would be a breach of nautical law or practice. Under the existing law, however, the magistrate is not called on for such strictly professional knowledge. With your permission, Sir, I propose hereafter to examine the general bearing and details of this important communication from the General Board of Health.

For the Journal of the Franklin Institute.

Electro-Chemical Engraving. By M. G. DERINCENZI.

The author has been for some years employed in a series of researches on the art of printing and reproducing designs by engravings in relief, and by printing type. The following is a description of his method.

The best metal for this kind of engraving is zinc. It is employed in

thin sheets, which are grained with sifted sand, and the design is made upon them with lithographic ink and pen. When the design is finished, it is prepared as if for the lithographic press. For this purpose, the plate is plunged into a decoction of nut galls for a minute. It is washed in pure water and gummed with a weak solution of gum arabic. The plate is moistened with a sponge, the design touched with essence of turpentine, and a lithographic cylinder coated with a varnish, rolled over the surface. This varnish covers exactly all the lines made by the designer. The varnish should have the following qualities: 1st, of not altering the design. 2d, of adhering strongly to the plate. 3d, of not being attacked by the chemical agents used to engrave it. The varnish known in England as *Brunswick Black*, mixed with oil of lavender, is preferable to all others. It is composed of asphaltic varnish, linseed oil boiled with litharge and turpentine. When the varnish is dry, the zinc plate is put in connexion with a plate of copper, at a distance of $\frac{1}{5}$ of an inch, and plunged into a solution of sulphate of zinc marking 15° , thus a voltaic couple is formed, and the sulphuric acid dissolves all the uncovered parts of the zinc. More or less depth is given to the engraving according to the nature of the design. Pencil drawings are generally engraved in four or five minutes, pen drawings in from seven to ten minutes. The sulphate of copper produces no alteration in the most delicate lines, and does not attack the varnish.

This mode of engraving may be applied to any other process by which a design is reproduced. The drawing may be made upon paper and transferred upon the plates. Impressions from lithographic stones, from copper, or steel, may be transferred. Graving tools may also be used, and as well upon the zinc as upon lithographic stones, for the purpose of producing a flat shade. This process is equally applicable to printing type. It is sufficient to have a page of a book transposed upon a plate of zinc to make a stereotype.

This mode of engraving will replace the ordinary stereotype. According to this method, a page of a book may be transposed, during the printing, upon thin sheets of zinc, and from these upon stouter sheets, for engraving whenever a reprint is desired. Hence arises a great economy in composition and paper, since it is not necessary to print large editions. A copy on thin sheets of zinc will not cost more than a copy on good paper.

In the same way a stereotype may be made of old books.—*Comptes Rendus de l'Academie des Sciences de Paris*, November, 1855.

On a New Coating for Walls. By M. CLAUDOT.

The author proposes to paint the walls with the milk of lime, which by absorption of carbonic acid from the air will form a permanent coating, and prevent the formation of lichens which stain and destroy the surfaces. He also suggests the same application as a species of enamel on mantels, clock-stands, and earthenware. (*Comptes Rendus de l'Academie des Sciences de Paris*, November, 1855.)

The process, is not new; it was suggested in this country many years ago; we believe, by Professor Emmet, of Baltimore. We have seen many