

*On the Protection of Iron by Zinc.* By M. MUNKEL.

Translated for the Journal of the Franklin Institute, by Prof. JNO. GRISCOM.

M. de Althaus, director of the salt works of Durrheim, has succeeded in protecting completely the evaporating pans of the works thirty feet in length, by nailing to them on the outside, bands of zinc and he observes that it is not necessary that the two metals be nicely polished at the points of contact. This fact, proved by a trial of more than ten years, lends support to the theory of contact. Ibid.

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*New Theory of the Galvanization of Metals.* By N. SCHONBEIN

Translated for the Journal of the Franklin Institute, by Prof. JNO. GRISCOM.

Iron, zinc, and copper, become oxydized in the air, in water, and in saline solutions, as well when they are united by contact to other metals, or attached to the poles of a pile, or when they are isolated but if a current can become established, how weak soever it may be then one of the metals which serves as the negative pole, or, which is the same thing, which receives the hydrogen, is no longer oxydated as before. It follows from this that the protection of copper by iron is due to a chemical decomposition of the water in question, how feeble soever the junction. It results from my experiments:

1. That neither common nor voltaic electricity is capable of modifying the chemical properties of bodies, and that, consequently, the electro-chemical theories of Davy and Berzelius can not be admitted

2. That the modifications which certain bodies undergo with respect to their chemical properties when subjected to contact, are due to the production of some substance and its deposition on these bodies by the action of the current.

3. That the most certain mode of protecting oxydizable metals against the action of free oxygen dissolved in water, is to place them in a voltaic circuit composed of the metal in question and a more oxydizable one, and the whole in an electrolytic fluid, like water which contains hydrogen. Ibid.

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*Prevention of Explosion in Steam-Engine Boilers.*

The Gold Isis Medal of the Society for the Encouragement of Arts, &c., was presented to Mr. ROBERT M'EWEN, Glasgow, for his Double Mercurial Safety-Valve for Steam-Engine Boilers.

There are two evils against which it is especially necessary to provide in the construction of an apparatus for preventing explosions in boilers, viz. the possibility of the steam passage being intentionally closed, for the purpose of obtaining extraordinary pressure; and the failure of the self-action of the apparatus through the accidental derangement of its parts.

Mr. M'Ewen's apparatus consists of a pair of open tubes, the ends of which are immersed in mercury contained in cups connected with the boiler by a pipe. At the junction of this pipe with its branches for the two cups, is a three-way cock, the ports of which are so pro-