Metallurgical Comment

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Correspondence and Discussion Invited

THE VALUE OF A MISTAKE.

At the recent meeting of the American Electrochemical Society, the course taken by one of the members in reading a paper on an experiment that proved unsuccessful brought forth very favorable comment as to the value of thus making public such data.

It is only too true that a great deal of information made public on scientific matters is pure "theorizing," and the reader in search of information is often at a loss what to accept, especially after he has had one or two "experiences." How valuable, then, is any such information dealing with an unsuccessful experiment, especially when it come from an authoritative source. In recommending such a procedure it would have to be done advisably, for, of course, objections will at once be raised that to make public all such information would be disclosing the material that constitutes the large portion of one's experience. This, no doubt, is to a certain extent very true; but let us look at the matter in another light.

The greater portion of one's time in any research work is taken up in finding out "ways and means," and it goes without saying that a great deal of this time would be saved if there were at one's disposal the whole record of other experiments, which, while not of the same nature, are distinctly allied so far as the method of attack is concerned. Now when we say the whole record, there would necessarily be included an account of unsuccessful attempts, the mistakes that are so often glossed over.

It is often said that the wise do not contemplate failure. Would it not be very much to the point to say, rather, that they avoid the mistakes of others? Following the argument still further, it is easily seen that mistakes would occur less frequently if more attention were paid to discussing the difficulties of problems. There would undoubtedly be a larger percentage of "commercial successes."

THE ANNIVERSARY OF A NOTABLE EVENT.

The fortieth anniversary of the first heat of Bessemer steel made at the Cambria Works, Johnstown, Pa., was lately celebrated, after having been postponed from July. The first blow was made on July 10th, 1871, under the direction of Capt. Robert W. Hunt, now of Chicago. It is a matter of common knowledge that the first successful heat of Bessemer steel was made at Wyandotte in the fall of 1864.

In an address to the gathering, Capt. Hunt, among other things, said:—"It is no doubt hard for Bessemer steel men of to-day to realize or even appreciate the conditions which surrounded our early work. All the pig iron had to be remelted in cupolas which could only be run a few hours before it would be necessary to drop the bottom and repair the tuyeres. Spiegel was melted in a reverberatory furnace. The tuyeres in the converter were of very uncertain life; turning down the vessel and blanking them in the middle of a heat was a common occurrence. We have seen the annual production of Bessemer steel in the U.S. grow from almost nil to 12,275,830 tons per year, and the number of works from 5, in 1871, to 71 in 1910.

THE INSTITUTE OF METALS.

The Failure of a Brazed Joint.

Professor H. Louis, M.A., B.Sc., Assoc. R.S.M.

The Paper gives a brief account of the investigation of the cause of a failure in the braze of a steam pipe on a steamer, undertaken at the instance of the Board of Trade. The author shows that the failure was due to corrosion following certain well-defined lines in the brass, and he traces the cause of these lines to the presence of small quantities of lead and tin in the original brazing spelter. The lead-tin alloy separating out between the crystals of brass formed planes of weakness that gave access to the corroding solutions, and this brought about the gradual corrosion of the entire brazing material.

The Corrosion of Brass, with Special Reference to Condenser Tubes.

Paul T. Bruhl, M.Sc.

It is urged by the author that so important a subject as the corrosion of brass by sea water, the neglect of which must mean no slight expenditure, should induce steamship companies to keep records bearing on the subject. It has been this lack of data that has hitherto retarded the solution of the corrosion problem. All the companies with whom correspondence was opened possessed "no definite information."

The corrosion of brass condenser tubes may conveniently be classed under four heads:—

1. Corrosion proper; where the metal is uniformly removed over the whole surface.

2. Dezincification; where the zinc being preferentially more rapidly removed than the copper, the surface of the metal becomes copper-rich in places. The action does not usually extend much below the surface, although it may occasionally be so marked as to result in copper "plugs."

3. Pitting. This is by far the most serious form of corrosion, as it considerably curtails the life of the tube. It is due to galvanic action between the deposit on and the metal of the condenser tube. It may occur in any portion of the tube, that is to say, in the roof and sides as well as along the floor. It most often occurs in the lowest portion of the tube because of the natural downward gravitation of any extraneous sediment, or of any insoluble product of corrosion.

4. Erosion. Here the mechanical influence of the stream of cooling water comes into play. Its effect is small and, under ordinary circumstances, uniform:—

The conclusions arrived at by the author are:—

(1). That the presence of air or an increase of temperature up to a certain point accelerates corrosion.

(2). That iron, nickel, and small amounts of lead are injurious; tin up to about 1 per cent., large amounts of lead, and aluminium are useful in diminishing corrosion.

(3). That the inlet pipe and the condenser plates should preferably be made of brass.

(4). That the condenser should be protected against stray currents.

(5). Protective coatings are not recommended.

(6). The importance of "spills" cannot be exaggerated.

(7). That the tubes should be flushed with clean water after use.