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SOME FACTORS AFFECTING THE RATE OF
CORROSION OF IRON

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Master of Science.

I N D E X

THEORIES OF CORROSION OF IRON

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The corrosion of iron, roughly follows one of two courses.

In the presence of moisture, and an abundance of oxygen, the familiar, yellowish, flaky scale known as rust, and corresponding to Fe^{++} appears. In conditions where the supply of oxygen is limited, however, such as in a sealed tube, this yellow substance gives way to a dark green or black substance corresponding to Fe^{+++} . In a piece of cast iron in a solution or in the soil, if the corrosion product be

ferrous, a large part of it may be dissolved away, leaving a mass

of graphite, and some ferrous rust which appears much as the original iron. Examination shows it to be soft and pulverent and altogether changed. This process is referred to as graphitization.

Iron as a metal was one of the first to become known to mankind and, as it rusts very visibly when moistened and exposed to air, one phase of its corrosion must have been observed almost as soon as the metal was first used. Of the observation of graphitization

has been observed in cannons and cannon balls raised from the sea, 1. however, there is no record until much later. Graphitization producing, incidentally, some amusing theories, to account for it.

2. In 1817 it was shown by Daniell that graphitization might be produced rapidly by using dilute acids on cubes of grey cast iron. The study of corrosion as a science begins with the work of Mallet, and since that time has been pursued with great vigor.