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HENRY BESSEMER AND THE STEEL REVOLUTION

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This article is written to commemorate the 150th anniversary of the birth of the man — not himself an ironmaster or metallurgist — whose invention transformed the iron and steel industry of Europe and the world. The monuments of this achievement are to be found wherever we look around us. On land, the ubiquitous motorcar, bridges, steel-framed buildings; in fact nearly all the durable consumer goods of this present age of mass consumption — and many of the expendable ones, too; for example, the tin cans for food, drinks, sprays etc. etc. On the seas, almost every ocean going vessel, from the 100'000 ton tankers, down to the floating, abandoned oil drum. One could say too, that all the multifarious machinery required for shaping, turning and constructing these objects of metal is itself made of steel¹). Now of course, the products of the world's steel furnaces and rolling mills — electronically controlled and the culmination of automation processes — measure many millions of tons, but it is a train of development springing from the experiments conducted in Bessemer's small converter from 1855 onwards.

The salient features of Henry Bessemer's career as an inventor are well-known and need no rehearsal here. Indeed seven years ago tributes were paid in all the leading metallurgical journals on the occasion of the centenary of the epoch marking paper read by Bessemer to the British Association for the Advancement of Science at Cheltenham in 1856. Since the editors

brief to the writer is to be original, all that one can do here is to make preparatory critical scrutiny of the facts which can be confirmed by independent evidence, subjecting Bessemer's *Autobiography* — still the chief source of any account of his work — to whatever light is thrown on its obscurities from other contemporary sources.

Bessemer's own character is apparently as unyielding to the careful historian as his steel to the impact of one of the shells from a Krupp's gun, itself fastened of Bessemer steel. Since it has not been possible to trace Bessemer's own private papers, nor of the patent-exploiting partnership of the inventor with Robert Longsdon, nor of the pioneering Sheffield works of Bessemer and his partners there, it is not yet possible to present a definitive portrayal of Bessemer and his work in the steel industry. However, it is now possible to look a little more closely at the experience of one of the British firms which took out an early licence and attempted to pioneer the pneumatic steel process. Once again, a good deal of the vital correspondence between the Trustees of the Dowlais Iron Company and Messrs. Bessemer and Longsdon, is no longer extant, but we can demonstrate with exact detail the results of this innovation when it was applied to the manufacture of steel rails by one of the largest concerns in the British iron and steel industry.

THE DEVELOPMENT OF MILD STEEL

In the 1860's the iron and steel industry experienced revolutionary technological innovations — the Bessemer and openhearth processes which created the heavy steel industry. From being an expensive and indispensable raw material of the cutler and to be used in small quantities, steel, or rather the new product 'mild steel', was transformed into the subject of mass-production techniques and was used

¹) This general statement is not intended to suppress the fact that a greater part of present day steel manufactures have their origin in the Open-Hearth furnaces; however, the impetus for the establishment of the large scale massproduction of steel sprang from the Bessemer innovation in the first place.