Men of Invention and Industry by Samuel Smiles

"Men there have been, ignorant of letters; without art, without eloquence; who yet had the wisdom to devise and the courage to perform that which they lacked language to explain. Such men have worked the deliverance of nations and their own greatness. Their hearts are their books; events are their tutors; great actions are their eloquence."--MACAULAY.

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PREFACE

I offer this book as a continuation of the memoirs of men of invention and industry published some years ago in the 'Lives of Engineers,' 'Industrial Biography,' and 'Self-Help.'

The early chapters relate to the history of a very important branch of British industry--that of Shipbuilding. A later chapter, kindly prepared by Sir Edward J. Harland, of Belfast,relates to the origin and progress of shipbuilding in Ireland.

Many of the facts set forth in the Life and Inventions of William Murdock have already been published in my 'Lives of Boulton and Watt;" but these are now placed in a continuous narrative, and supplemented by other information, more particularly the correspondence

between Watt and Murdock, communicated to me by the present representative of the family, Mr. Murdock, C.E, of Gilwern, near Abergavenny.

I have also endeavoured to give as accurate an account as possible of the Invention of the Steam-printing Press, and its application to the production of Newspapers and Books,--an invention certainly of great importance to the spread of knowledge, science, and literature, throughout the world.

The chapter on the "Industry of Ireland" will speak for itself.It occurred to me, on passing through Ireland last year, that much remained to be said on that subject; and, looking to the increasing means of the country, and the well-known industry of its people, it seems reasonable to expect, that with peace,security, energy, and diligent labour of head and hand, there is really a great future before Ireland.

The last chapter, on "Astronomers in Humble Life," consists for the most part of a series of Autobiographies. It may seem, at first sight, to have little to do with the leading object of the book; but it serves to show what a number of active, earnest, and able men are comparatively hidden throughout society, ready to turn their hands and heads to the improvement of their own characters, if not to the advancement of the general community of which they form a part.

In conclusion, I say to the reader, as Quarles said in the preface to his 'Emblems,' "I wish thee as much pleasure in the reading as I had in the writing." In fact, the last three chapters were in some measure the cause of the book being published in its present form.

London, November, 1884.

CHAPTER I. PHINEAS PETT: BEGINNINGS OF ENGLISH SHIP-BUILDING.

"A speck in the Northern Ocean, with a rocky coast, an ungenial climate, and a soil scarcely fruitful,--this was the material patrimony which descended to the English race--an inheritance that would have been little worth but for the inestimable moral gift that accompanied it. Yes; from Celts, Saxons, Danes,Normans--from some or all of them--have come down with English nationality a talisman that could command sunshine, and plenty,and empire, and fame. The 'go' which they transmitted to us--the national vis--this it is which made the old Angle-land a glorious heritage. Of this we have had a portion above our brethren--good measure, running over. Through this our island-mother has stretched out her arms till they enriched the globe of the earth....Britain, without her

energy and enterprise, what would she be in Europe?"--Blackwood's Edinburgh Magazine (1870).

In one of the few records of Sir Isaac Newton's life which he left for the benefit of others, the following comprehensive thought occurs:

"It is certainly apparent that the inhabitants of this world are of a short date, seeing that all arts, as letters, ships,printing, the needle, &c., were discovered within the mry of history."

If this were true in Newton's time, how much truer is it now. Most of the inventions which are so greatly influencing, as well as advancing, the civilization of the world at the present time,have been discovered within the last hundred or hundred and fifty years. We do not say that man has become so much wiser during that period; for, though he has grown in Knowledge, the most fruitful

of all things were said by "the heirs of all the ages" thousands of years ago.

But as regards Physical Science, the progress made during the last hundred years has been very great. Its most recent triumphs have been in connection with the discovery of electric power and electric light. Perhaps the most important invention, however,was that of the working steam engine, made by Watt only about a hundred years ago. The most recent application of this form of energy has been in the propulsion of ships, which has already produced so great an effect upon commerce, navigation, and the spread of population over the world.

Equally important has been the influence of the Railway--now the principal means of communication in all civilized countries. This invention has started into full life within our own time. The locomotive engine had for some years been employed in the haulage of coals; but it was not until the opening of the Liverpool and Manchester Railway in

1830, that the importance of the invention came to be acknowledged. The locomotive railway has since been everywhere adopted throughout Europe. In America,Canada, and the Colonies, it has opened up the boundless resources of the soil, bringing the country nearer to the towns,and the towns to the country. It has enhanced the celerity of time, and imparted a new series of conditions to every rank of life.

The importance of steam navigation has been still more recently ascertained. When it was first proposed, Sir Joseph Banks,President of the Royal Society, said: "It is a pretty plan, but there is just one point overlooked: that the steam-engine requires a firm basis on which to work." Symington, the practical mechanic, put this theory to the test by his successful experiments, first on Dalswinton Lake, and then on the Forth and Clyde Canal. Fulton and Bell afterwards showed the power of steamboats in navigating the rivers of America and Britain.

After various experiments, it was proposed to unite England and America by steam. Dr. Lardner, however, delivered a lecture before the Royal Institution in 1838, "proving" that steamers could never cross the Atlantic, because they could not carry sufficient coal to raise steam enough during the voyage. But this theory was also tested by experience in the same year, when the Sirius, of London, left Cork for New York, and made the passage in nineteen days. Four days after the departure of the Sirius, the Great Western left Bristol for New York, and made the passage in thirteen days five hours.[1] The problem was solved;and great ocean steamers have ever since passed in continuous streams between the shores of England and America.

In an age of progress, one invention merely paves the way for another. The first steamers were impelled by means of paddle wheels; but these are now almost entirely superseded by the screw. And this, too, is an invention

almost of yesterday. It was only in 1840 that the Archimedes was fitted as a screw yacht.

A few years later, in 1845, the Great Britain, propelled by the screw, left Liverpool for New York, and made the voyage in fourteen days. The screw is now invariably adopted in all long ocean voyages.

It is curious to look back, and observe the small beginnings of maritime navigation. As regards this country, though its institutions are old, modern England is still young. As respects its mechanical and scientific achievements, it is the youngest of all countries. Watt's steam engine was the beginning of our manufacturing supremacy; and since its adoption, inventions and discoveries in Art and Science, within the last hundred years,have succeeded each other with extraordinary rapidity. In 1814 there was only one steam vessel in Scotland; while England possessed none at all. Now, the

British mercantile steam-ships number about 5000, with about 4 millions of aggregate tonnage.[2]

In olden times this country possessed the materials for great things, as well as the men fitted to develope them into great results. But the nation was slow to awake and take advantage of its opportunities. There was no enterprise, no commerce--no "go" in the people. The roads were frightfully bad; and there was little communication between one part of the country and another.

If anything important had to be done, we used to send for foreigners to come and teach us how to do it. We sent for them to drain our fens, to build our piers and harbours, and even to pump our water at London Bridge. Though a seafaring population lived round our coasts, we did not fish our own seas, but left it to the industrious Dutchmen to catch the fish, and supply our markets. It was not until the year 1787 that the Yarmouth people began the deep-

sea herring fishery; and yet these were the most enterprising amongst the English fishermen.

English commerce also had very slender beginnings. At the commencement of the fifteenth century, England was of very little account in the affairs of Europe. Indeed, the history of modern England is nearly coincident with the accession of the Tudors to the throne. With the exception of Calais and Dunkirk, her dominions on the Continent had been wrested from her by the French. The country at home had been made desolate by the Wars of the Roses. The population was very small, and had been kept down by war, pestilence, and famine.[3] The chief staple was wool, which was exported to Flanders in foreign ships, there to be manufactured into cloth. Nearly every article of importance was brought from abroad; and the little commerce which existed was in the hands of foreigners. The seas were swept by privateers, little better than pirates, who plundered without scruple every vessel, whether friend or foe, which fell in their way.

The British navy has risen from very low beginnings. The English fleet had fallen from its high estate since the reign of Edward III., who won a battle from the French and Flemings in 1340, with 260 ships; but his vessels were all of moderate size, being boats, yachts, and caravels, of very small tonnage. According to the contemporary chronicles, Weymouth, Fowey, Sandwich, and Bristol, were then of nearly almost as much importance as London;[4] which latter city only furnished twenty-five vessels,with 662 mariners.

The Royal Fleet began in the reign of Henry VII. Only six or seven vessels then belonged to the King, the largest being the Grace de Dieu, of comparatively small tonnage. The custom then was, to hire ships from the Venetians, the Genoese, the Hanse towns, and other trading people; and as soon as the service for which the vessels so hired was performed, they were dismissed.

When Henry VIII. ascended the throne in 1509, he directed his attention to the state of the navy. Although the insular position of England was calculated to stimulate the art of shipbuilding more than in most continental countries, our best ships long continued to be built by foreigners. Henry invited from abroad, especially from Italy, where the art of shipbuilding had made the greatest progress, as many skilful artists and workmen as he could procure, either by the hope of gain, or the high honours and distinguished countenance which he paid them. "By incorporating," says Charnock, "these useful persons among his own subjects, he soon formed a corps sufficient to rival those states which had rendered themselves most distinguished by their knowledge in this art; so that the fame of Genoa and Venice, which had long excited the envy of the greater part of Europe, became suddenly transferred to the shores of Britain."[5]

In fitting out his fleet, we find Henry disbursing large sums to foreigners for shipbuilding, for "harness" or

armour, and for munitions of all sorts. The State Papers[6] particularize the amounts paid to Lewez de la Fava for "harness;" to William Gurre,"bregandy-maker;" and to Leonard Friscobald for "almayn ryvetts."

Francis de Errona, a Spaniard, supplied the gunpowder. Among the foreign mechanics and artizans employed were Hans Popenruyter,gunfounder of Mechlin; Robert Sakfeld, Robert Skorer, Fortuno de Catalenago, and John Cavelcant. On one occasion 2,797L. 19s. 4 1/2d. was disbursed for guns and grindstones. This sum must be multiplied by about four, to give the proper present value. Popenruyter seems to have been the great gunfounder of the age;he supplied the principal guns and gun stores for the English navy, and his name occurs in every Ordnance account of the series, generally for sums of the largest amounts.

Henry VIII. was the first to establish Royal dockyards, first at Woolwich, then at Portsmouth, and thirdly at