

TECHNOLOGICAL HANDBOOKS.

COTTON WEAVING.

A
TECHNOLOGICAL HANDBOOKS.

M 194
35 COTTON WEAVING:

ITS DEVELOPMENT, PRINCIPLES,
AND PRACTICE.

GEORGE BELL & SONS

LONDON: YORK STREET, COVENT GARDEN
AND NEW YORK: 66, FIFTH AVENUE
CAMBRIDGE: DEIGHTON, BELL AND CO.

BY
RICHARD MARSDEN, MEM. SOC. ARTS,
HONORARY EXAMINER TO THE CITY AND GUILDS OF LONDON
INSTITUTE.

AUTHOR OF "COTTON SPINNING: ITS DEVELOPMENT,
PRINCIPLES, AND PRACTICE," ETC.

EDITOR OF "THE TEXTILE MERCURY."

LONDON: GEORGE BELL & SONS,

MANCHESTER: MARSDEN & CO., LIMITED.

1895.

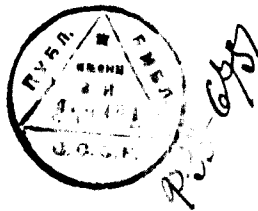
23498

A

PREFACE.

THE following work, which is complementary to the writer's former treatise upon "Cotton Spinning," was designed at the same time, and originally intended to appear at a comparatively short interval thereafter. Events occurred, however, which compelled the author to lay down the task. When resumed it had to be performed simultaneously with the heavy work of conducting a weekly trade journal, "The Textile Mercury." Had the writer not felt in honour bound to the publishers to complete it, it would probably have been abandoned in the face of more important demands. The task is now, however, finished, and he would take this opportunity of acknowledging the great patience and kindness of Messrs. Bell and Sons in waiting, and that without pressure, until circumstances permitted it to be resumed and carried to a conclusion.

The work is sent forth by the writer in the hope and trust that it will contribute to increase the interest of those whose lives, capital, and energies are practically invested in the cotton trade; and whose welfare, and that of generations of their descendants to follow, are inseparably bound up in the conservation of its interests and the promotion of its prosperity. And beyond this class there is another he would desire to affect, namely, those who care something for the great interests of the State. If any one choose to examine the industrial development of the country, thoroughly, and without bias or prejudice, it will be found that its



CHISWICK PRESS—CHARLES WHITTINGHAM AND CO.
TOOKS COURT, CHANCERY LANE, LONDON.

eminence in almost everything that makes a nation great, originated in and is maintained by its mechanical industries. And of these the cotton trade was the first, thus becoming the foundation stone of its eminence. There is one lesson that should and will be drawn if the history of the cotton trade be read wisely : it is, that the trade does not belong to the merchants, capitalists, and workpeople of the present generation, but that it is a great national property in which they possess only a life interest. This they are bound by every sentiment of affection for their children and love for their country to pass on to succeeding generations, not only unimpaired, but increased in value. To neglect this duty will be to deprive millions of English people in the future of the means of livelihood, and the nation of one of its most important resources. This would be politically criminal and would do much to depose the country from its eminence in the community of nations. There is also a further duty incumbent upon those whose chief interests are connected with this trade. This is to protect it from external aggression, especially that of ignorant legislators, whose capacities for mischief have been so extensively manifested in the Parliament just dissolved. No more important duty can engage attention than that of the critical examination of the legislative projects affecting it brought forward in the House of Commons, and to give strenuous resistance to every one that will act adversely to its well-being.

The present work is an exposition of the development, principles, and practice of the weaving division of the trade, as the former volume was of the spinning division. In its execution the writer has adhered to the plan of the former work, which has received the emphatic approval of all readers interested in the subject. If there be any difference it will be found in the fuller and more careful exposition of the origin and development of the subsidiary processes, and of the invention and improvement of the series of machines employed in this section of the trade. An effort

has been made to clearly define the art of weaving, to trace its development from the primitive germ through all the succeeding stages of its growth to its present wonderful perfection. In the course of the narrative care has been taken to show when and why it has developed tendencies to divide and subdivide, throwing those branches off as separate processes that have become known by other names, though they still are and must ever remain adjuncts of the original parent of the whole, namely, the weaving process. By a careful perusal of what has been written the reader will be able to understand the causes and requirements in which originated not only every part of the loom but of those of almost all the machines employed in the preparatory processes. With this knowledge the intelligent technical reader will easily decide, when further changes or innovations are proposed, whether they are in harmony or conflict with the leading principles embodied in what has already been accomplished, and whether their adoption will prove advantageous or otherwise. All changes are not improvements, and the money spent upon those that are valueless will be simply so much wasted ; and the condition of the trade is not such as to admit of waste.

Weaving, of course, is one of the most ancient arts, and cotton weaving in India at least can reckon its history by centuries. In England it is, however, one of the most modern industries, and the development of the English system of manufacturing constitutes one of the most remarkable series of phenomena to be found in human history ; and the benefits that have resulted directly and indirectly have seldom if ever been equalled from a single cause. For more than half a century these advantages were almost monopolized by this country, but during the half century which will come to a close in a few years they have been appropriated to a more or less extent by almost every other nation. England can only therefore expect to continue to receive a large share of its benefits by keeping well in front with its inventions and improvements, and for this

she must depend not only upon her present inventors, but upon a further development of the inventive faculty. That this may to some extent be stimulated by the present work is one of the desires of its author.

RICHARD MARSDEN.

MANCHESTER,
August, 1895.

CONTENTS.

CHAPTER I. INTRODUCTORY.

	PAGE
The division of the cotton trade into two branches, spinning and manufacturing—India, its birthplace—Indian processes; the Institutes of Menu—Indian competition with the English textile industries the origin of the English cotton trade—Early tendency of the English trade to divide into two sections—Temporary tendency to reunite—Reaction and probable permanency of the division	1-8

CHAPTER II. EARLY WEAVING AND THE DEVELOPMENT OF THE HAND-LOOM.

Weaving an ancient art; definitions—Its origination in man's necessities—Classic stories of its invention—Modern research and geographical discovery show its wide prevalence—Conjectural origin—Ancient Egyptian weavers, their looms and materials—Survival of the purely manual art—Progress of invention—Supposed looms of the fourth century, A.D.—Stimulations to further improvements; successive advances—The shuttle in its incipient stages; its gradual development—The lathe in its earliest and some succeeding forms—An equipoise between the several parts of the loom; also between spinning and weaving—The horizontal loom and its gradual improvement—The Indian loom; the pacing motion—The loom as Kay found it; its survival in Wales to the present time—The Indian loom described; the Indian weaver humidifies his warp—Loom of Sumatra and Java—Of Japan—Of Salomon Islands—Of New Caledonia—Of Ashango Land—Kay's invention of the fly shuttle—Disturbs the balance between spinning and weaving—Robert Kay's invention of the drop shuttle-box	9-54
--	------