

# **SHOP MANAGEMENT**

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Shop Management by Frederick Winslow Taylor & Henry R. Towne

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**FREDERICK WINSLOW TAYLOR & HENRY R. TOWNE**

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*Shop Management*

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WITH AN INTRODUCTION BY

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## FOREWORD

BY HENRY R. TOWNE

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*President of the Yale and Towne Manufacturing Company*

AS a fellow-worker with Dr. Taylor, in the field of industrial management, I have followed the development of his work, almost from its commencement, with constantly increasing admiration for the exceptional talent which he has brought to this new field of investigation, and with constantly increasing realization of the fundamental importance of the methods which he has initiated. The substitution of machinery for unaided human labor was the great industrial achievement of the nineteenth century. The new achievement to which Dr. Taylor points the way consists in elevating human labor itself to a higher plane of efficiency and of earning power.

In a paper entitled "The Engineer as an Economist," contributed to the *Proceedings* of The American Society of Mechanical Engineers in May, 1886, I made the following statements:

"The monogram of our national initials, which is the symbol for our monetary unit, the dollar, is almost as frequently conjoined to the figures of an engineer's calculations as are the symbols indicating feet, minutes, pounds, or gallons. The final issue

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of his work, in probably a majority of cases, resolves itself into a question of dollars and cents, of relative or absolute values. . . . To ensure the best results, the organization of productive labor must be directed and controlled by persons having not only good executive ability, and possessing the practical familiarity of a mechanic or engineer, with the goods produced and the processes employed, but having also, and equally, a practical knowledge of how to observe, record, analyze, and compare essential facts in relation to wages, supplies, expense accounts, and all else that enters into or affects the economy of production and the cost of the product."

As pertinent to the subject of industrial engineering, I will also quote the following from an address delivered by me, in February, 1905, to the graduating students of Purdue University:

"The *dollar* is the final term in almost every equation which arises in the practice of engineering in any or all of its branches, except qualifiedly as to military and naval engineering, where in some cases cost may be ignored. In other words, the true function of the engineer is, or should be, not only to determine how physical problems may be solved, but also how they may be solved most economically. For example, a railroad may have to be carried over a gorge or arroyo. Obviously it does not need an engineer to point out that this may be done by filling the chasm with earth, but only a bridge engineer is competent to determine whether it is cheaper to do this or to bridge it, and to design the bridge which will safely and most cheaply serve, the cost of which

should be compared with that of an earth fill. Therefore the engineer is, by the nature of his vocation, an economist. His function is not only to design, but also so to design as to ensure the best economical result. He who designs an unsafe structure or an inoperative machine is a bad engineer; he who designs them so that they are safe and operative, but needlessly expensive, is a poor engineer, and, it may be remarked, usually earns poor pay; he who designs good work, which can be executed at a fair cost, is a sound and usually a successful engineer; he who does the best work at the lowest cost sooner or later stands at the top of his profession, and usually has the reward which this implies."

I avail of these quotations to emphasize the fact that industrial engineering, of which shop management is an integral and vital part, implies not merely the making of a given product, but the making of that product at the *lowest cost* consistent with the maintenance of the intended standard of quality. The attainment of this result is the object which Dr. Taylor has had in view during the many years through which he has pursued his studies and investigations. The methods explained and the rules laid down in the following monograph by him — probably the most valuable contribution yet made to the literature of industrial engineering — are intended to enable and to assist others engaged in this field of work to utilize and apply his methods to their several individual problems.

The monograph which is here republished was Dr. Taylor's first great contribution to industrial engi-

neering, the second being the paper entitled "On the Art of Cutting Metals" (248 pages, with 24 insert folders covering illustrations and tables) which he presented as his Presidential Address to The American Society of Mechanical Engineers at its meeting in December, 1906, in the discussion of which at that meeting I made the following comments:

"Mr. Taylor's paper on 'The Art of Cutting Metals' is a masterpiece. Based on what is undoubtedly the longest, largest, and most exhaustive series of experiments ever conducted in this field, its summary of the conclusions deduced therefrom embodies the most important contribution to our knowledge of this subject which has ever been made. The subject itself relates to the foundation on which all of our metal-working industries are built.

"About sixty years ago American invention lifted one of the earliest and most universal of the manual arts from the plane on which it had stood from the dawn of civilization to the high level of modern mechanical industry. This was the achievement of the sewing-machine. About thirty years ago, American invention again took one of the oldest of the manual arts, that of writing, and brought it fairly within the scope of modern mechanical development. This was the achievement of the typewriting-machine. The art of forming and tempering metal tools undoubtedly is coeval with the passing of the stone age, and, therefore, in antiquity is at least as old, if indeed it does not outrank, the arts of sewing and writing. Like them it has remained almost unchanged from the beginning until nearly the