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THE PART WHICH ACCOUNTING HAS PLAYED IN THE DEVELOPMENT OF MODERN INDUSTRY

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A Paper read before the AMERICAN ELECTRIC RAILWAY ACCOUNTANTS' ASSOCIATION
HISTORIANS tell us that no nation has ever become highly civilized without having developed commercially. Trade, it is said, has served as the medium for promoting intercourse among peoples. Intercourse is the basis of culture. It is suggested by Woolf, in his "History of Accountants and Accounting," that "the higher the stage of culture and development attained by a community the more elaborate are its methods of account. Accounting is the mirror of the age, and in it we see reflected much of a nation's commercial history and social conditions."

While there is doubtless something in this contention, I am not sure but that Woolf is overenthusiastic, even though honest in his conviction as to the important part which accounting has played in the world's history. There is, however, in observing transpiring events, reason to believe that accounting has played, and is playing, a somewhat important part in the development of modern industry, especially in the United States.

The earliest influence exerted by bookkeeping and accounting is difficult to trace. By some they are credited with having been responsible for the invention of the alphabet. The Phoenicians were essentially a commercial people. Drawing on the raw materials of other countries they manufactured products which were distributed throughout the ancient world. They are said to have been the first people of antiquity to obtain such mastery of the sea that it could be made dependable for the
organization of regular transportation. From them the Greeks learned to direct the course of their ships at night by the north, or as the Greeks call it, the "Phoenician" star. Tyre and Sidon, two cities of Palestine on the Mediterranean coast of Turkey in Asia were about 1500 B.C. the center of a world-commerce controlled by the Phoenicians. In their trading on the Egyptian coast they were greatly retarded by the elaborate and complicated word-signs which made the understanding of the financial records difficult. To simplify this work it is said that the Phoenicians invented the alphabet.

As early as the eleventh century there was a maritime law ordering the public scribe, or notary of the commune to render an account of all goods carried in ships and of those received or sold. In 1225 we find the chief magistrate of Milan undertaking to render full accounts three times a year. In 1387 the commission entrusted with the building of the cathedral at Milan appointed an accountant and an auditor.

While it is impossible to discover any direct relation between the two facts, it is true that Italy, with Venice as the center, enjoyed great prosperity as a result of a marked activity in commerce and banking from the twelfth to the fifteenth century, and that during this time bookkeeping received a tremendous impetus, which still endures. In November, 1494, a Franciscan monk named Lucas Pacioli, who resided in Venice, produced a treatise on arithmetic and geometry, a part of which was devoted to the "Particulars of Reckonings and Their Recordings." This appears to be the first attempt at scientific bookkeeping and sets forth many of the principles upon which modern, double-entry bookkeeping rests.

The connection between the affairs of the time and the first organization of accountants of record is not apparent. In 1581 there was established at Venice an
association known as the "College of Accountants." The motive which prompted the "College of Accountants" may have been the regulation of practice which became necessary because of the increase in numbers. This, in turn, may have been caused by the strenuous times in Italy which followed the falling off in trade after the East Indian Ocean route was discovered in 1498. We are told that the accountants of those times did not receive regular fees, but were paid a percentage of the amount of errors and defalcations which they discovered.

Were the point to be stretched, it is probable that bookkeeping and accounting might be made responsible for the establishment of definite systems of currency in the various countries and the introduction of the Arabic system of notation in place of the cumbersome Roman system of numerals in which accounts were formerly kept. This change has been generally thought to have occurred during the sixteenth century. It is interesting to note, however, that in the original of Pacioli's work on double-entry bookkeeping, recently reproduced by Geijsbeek, that Arabic numerals were used. This would seem to indicate that the Arabic numerals were generally in use as early, at least, as 1494.

It sometimes seems as if there were nothing fundamentally new about accounting. The late Charles Waldo Haskins in an address at the opening of the New York University School of Commerce, Accounts and Finance, on October 2, 1900, spoke of the Egyptians and their accounting in an interesting manner as follows:

"Egypt, the land of the papyrus, was a country of scribes. Everything was recorded even to monumental descriptions of the recorders themselves. These men, more or less, according to position or capacity, did all the bookkeeping, all the auditing, all the rendering of accounts. Their book was a papyrus roll; their pen was a reed from the banks of the Nile; their inks were red and black."
and their inkstands were little pots fitted into a wooden hand-palette. In the chiselled and painted pictures of the glory of the Pharaohs we find these accountants keeping track of all the items of the vast, royal revenue, of the income and outgo, of every slave's back-load of wheat in the granaries; and if anything is missing anywhere, we are sure to have somewhere a description of the hunt for the shortage and the fixing of responsibility under the guidance of the gods of light."

As a country develops commercially and industrially so, apparently, does accounting in its application especially make progress. Germany, slow to develop industrially, has never been noted for prominence in accounting. England, on the contrary, has long been an industrial and commercial leader. It is in Great Britain that, until recently, accounting and accountancy have taken the greatest strides. The United States as a commercial and industrial country is comparatively new, consequently accounting is, relatively speaking, in an undeveloped stage.

Modern accounting of a constructive character may almost be said to date from the beginning of the trust movement. Brown, in his "History of Accounting," speaks of some of the so-called ledgers preserved from the period 1300 to 1400 as being "obviously intended to serve only as aids to the memory in retaining the details of numerous transactions." So, doubtless, will future historians speak of some of the financial statements of the period from 1492 to 1898 in the United States. With the exception of the steam railroads, which must be given credit for the pioneer work which they did, very few concerns prior to 1898 used their financial data, granting that they recorded and compiled it, as a basis for administration.

The trust movement in the United States began in 1898. During the three years which followed, one hundred and forty-nine large combinations with a total capitali-
zation of $3,578,650,000 were formed. Many writers and some fairly prominent authorities predicted failure. It was agreed that no one man or board of directors could successfully administer such huge organizations. The United States Steel Corporation and the United States Rubber Company could scarcely be called failures. Accounting made it possible for the executives who were placed at the heads of these giant corporations, with their many constituent companies, to have laid before them information as to what was being done. Accounting made it possible to run a huge business as intelligently as a small business had previously been run.

The past fifteen years in the United States have seen a tremendous forward movement in accounting. The Interstate Commerce Commission, as well as public service commissions throughout the country, have adopted systems of accounting as a means of obtaining information as a basis for control of public utility companies. No longer is the detection of fraud and error the chief aim of an accounting system. It has been discovered that it will gather information which will not only permit comparison of companies of the same class, but serve the purposes of the company manager and the investor, present or prospective, not to mention the taxpayer. A. W. Dimock in his book, "Wall Street and the Wilds," relates how he traveled about from Chicago in 1873 when "conductors owned the railroads and the thought of friends of theirs paying toll on their lines would have sounded the depth of inhospitality." It is doubtful if the accounting system of to-day permits hospitality to such an extent.

In other lines the progress was equally marked. The street railway industry was among the first to recognize the need for, and to work out, a uniform accounting system. The National Retail Dry Goods Association has heard the call and answered with a system for its members.
The Harvard School of Business Administration through its research laboratory has provided a system for the shoe industry, and is now, I believe, at work on one for the drug trade. The American Telephone and Telegraph Company, with its lines and property spread over the entire United States, has a most comprehensive accounting system without which the administration of such an organization would be impossible.

Everywhere is manifested interest in accounting. The economic cause of the interest is undoubtedly competition. Except in undeveloped or unexploited fields or industries, where large profits come through force of circumstances and not good management based on facts, accurate information must be had. An instance came to my attention four or five years ago where a picture postcard concern continued in business for two years without any books. Such cases are rare, however. One of the first steps in the organization of any concern is to organize the accounting department. The American International Corporation recently organized, but destined probably to be a force in the world's commerce of the future, gave attention among the very first things to the organization of the accounting and auditing department.

The Federal government by passing the federal income tax law served to draw the attention not only of the corporation but the individual to the necessity of keeping better financial records.

With the prosperity of the country after the present war in question, the Federal Trade Commission is urging upon businessmen the importance of enlarging their knowledge of accounting and improving their accounting methods. With this end in view the commission has recently issued two notable pamphlets. One is entitled "A System of Accounts for Retail Merchants"; the other "Fundamentals of a Cost System for Manufacturers."

As a concrete illustration of what ac-
counting has done to serve administration, it may be interesting to note what Mr. Henry P. Schuit, a factory-cost expert, wrote the author concerning some of his work in a plant out in Pennsylvania. Mr. Schuit says:

"On my present engagement I have had an interesting experience in the handling of stores and in the establishment of a control of them. This company has been manufacturing a line of goods on which they owned all patents and therefore had a monopoly. But, as the patents ran out, competition entered the field with the consequent reduction in prices. During the period that the company enjoyed the monopoly, the profits were large and no attention was paid to quantities of goods manufactured or to the wastage.

"This loose habit of management had become so fixed upon the executives that they were not handling the operating end of their business properly. It took me a long time to convince them of the necessity of the establishment of stock rooms, offering such excuses as 'it being cheaper to have the material near the machines, it would be an unnecessary expense to have a stock-man, too much trouble to keep a stock record, and many other similar ones.'

"I finally got the stock rooms started; there are now three. The first one proved their necessity. After accumulating all of the products of the line of goods, we found to the surprise and consternation of all that there were over 160,000 pieces of this one line alone, when 10,000 pieces would have been an ample working stock.

"This material was found in every conceivable place, around machines, under benches, in gangways, in out-of-the-way nooks, and even in scrap piles in the blacksmith shop. The stock, of course, was the accumulation of years, manufactured in advance during their period of prosperity and then stored away and forgotten. No accounting was made of it excepting inventory time when it was merely lumped."
"This product was in every imaginable condition, some of it just started, and from that stage to every degree of completion up to the finished article. It took a long time to gather this product and even roughly classify it—several months. I had it classified sufficiently merely to serve the present practical purposes. It will take a year or more to sort it into the classification in which it will be ultimately required.

"As soon as we got the product together and began drawing on it, there was a difference immediately. It had been the custom, before I came here, to take an order and make it from raw materials; rarely attempting to find it in stock. From 85% to 90% of the orders were manufactured from raw material; now it seldom exceeds 3%. The department that has been working on raw material is now devoted to other purposes. Not a bit of raw material has been purchased since the new system has started, and it will not be necessary for a long time to come. In fact, the unfilled orders have been cancelled.

"Another result that has been affected through this control is the cheapening of the cost of manufacture. As soon as the stock rooms were established and the controlling stock ledgers started, all orders were sent to the stock keeper for him to fill and deliver to the department that was to work upon them. To the surprise of all we began to discover the great amount of spoilage, and by the very employees that were supposed to be the best men. Nothing was said to them, believing that the moral effect would change them. It did; these men realizing that the automatic working out of the system would show up the results of their work became more careful workmen. By the end of two months the percentage of spoilage became a figure hardly worth mentioning.

"Another saving that has been made is in the time of the employee. All material is now delivered to him, he loses no time looking for his material or going to the first department
which formed the raw material for him; in fact, the men have no business away from their machines or benches.

"Formerly, the men reported time working on stock which they frequently did when work was slack. Now this is a thing of the past; every bit of work goes through on order, raw material or partly finished product brought to a greater degree of completion, receives the same attention as the customer's order.

"This control of labor and material has brought about most surprising results. The profits are hardly believable. Before I came here the management was considering the advisability of discontinuing this line of business. It has turned out the most profitable.

"I am writing you this letter to give you an illustration of the results that can be obtained by establishing an effective and simple control of stock, and to show that a stock record does not mean a mere record of the stock on hand, but, as well, one of the mediums for controlling the operations of a factory. In this case it even made better workmen of the employees."

Industry everywhere in the United States seems to be awakening to the need of accounting. The possibilities of accounting, which the big combinations were quick to see and make profitable use of, are now being realized by the rank and file of industrial organizations. The experience of the concern related by Mr. Schuit is rapidly becoming the experience of many concerns. Good accounting with intelligent use of the information presented increases profits and stimulates industry. Business is a mass of financial transactions. Business without knowledge concerning these transactions means failure. Knowledge without accounting is impossible.