

In the section devoted to the evaporation of brine salt there were the following headings:

- The "Vacuum" Process
- Operation of Equipment at Capacity
- Maintenance of Equipment
- Use of Dealers' Bags
- Packing in Boxes
- Advertising "Vacuum" Salt

Recommendations as to the management at Wieliczka were under the following headings:

- Changes in Management
- Saving the Time of Workmen
- Paying Workmen by Results
- Records of Production and Costs

Chapter 4 covered the allocation of production and gave a summary of the reductions in cost which would result from the recommended changes.

Chapter 5 dealt with the distribution of salt in Poland, and Chapter 6 with the export of Polish salt.

The concluding chapter summarized the thirty-six recommendations which had appeared in the preceding chapters.

The Tobacco Report

The same general plan was followed in the report on the tobacco monopoly.

Chapter 1 was an introduction. Chapter 2 covered "The Purchase and Storage of Raw Tobacco." Chapter 3 dealt with "Manufacturing Tobacco Products" and its sub-divisions were as follows:

- Number of Factories
- Types of Factory Buildings
- Remodeled Apartment Houses
- Rebuilt Tobacco Factories
- Additions and New Buildings
- Ventilation
- Artificial Lighting
- Shipping Facilities
- Layout of Factories
- Improvements in Operations
- Handling Materials
- Maintaining Uniform Quality of Output
- Manufacturing Boxes and Printing Labels

Chapter 4 dealt with "Distribution of Tobacco Products" and the final chapter with the "Control and Policies of the Tobacco Monopoly."

What action the Polish Government will take on these recommendations remains to be seen.

Visits to Other Polish Industries

Before starting out on my tours of inspection of salt and tobacco plants the Minister of Industry

asked me to visit several other government owned industries and some privately owned plants in order to get a fairly comprehensive view of Polish industry.

As you know, Poland is a rather large country. It has an area of 150,000 square miles, which is approximately the same as all of New England, New York State and Pennsylvania, with about the same population, that is, almost 30,000,000 people. We traveled by river steamer, by rail, by automobile and by airplane. Traveling was comfortable: trains were always on time, although the schedules were rather slow; sleeping cars were more comfortable than Pullmans; the motor cars were of the best continental makes, and the roads outside of the cities were good; the airplanes were quite safe and of course very fast; hotels were comfortable, the meals being usually better than in the average American hotel, but the rooms not so good. At a number of places we were guests of the plants visited, for outside of the large cities it is customary for plants to maintain suites of rooms for the entertainment of their visitors.

I visited the following:

- A cotton mill with 280,000 spindles and 7,500 looms.
- Two wooden mills.
- Four coal mines.
- A plant for refining lead and silver.
- A cement plant.
- A nitrate fixation plant.
- A steel mill and iron foundry.
- A boiler shop and structural iron plant.
- A locomotive works.
- A government mint.
- The oil fields at Boryslaw.
- Two potash mines.
- Natural gas wells.
- A government oil refinery.
- A super-phosphate mine.
- A sugar refinery.
- Water works and sewer constructions.

The visits covered in all about fifty industrial establishments, including those of the two monopolies.

I was agreeably impressed with Polish plants as a whole. A few of them need more working capital and some need modernized equipment, but most of them require better methods of control and quicker turnover of their investment. Managers

of the plants visited were open minded and eager to improve their processes. Some traces of American methods were apparent in nearly all plants, and in five of these plants visited I found Gantt Charts being used to good advantage.

I spent a whole day at Chorzow, the nitrate fixation plant belonging to the Government, which was equipped and organized by Moscicki, the President of Poland. This plant is remarkably well laid out and equipped and the organization seems to function like clock-work. The Polish Government has reason to be proud of this plant and of the man who is responsible for its success. As you know, Moscicki is an electro-chemical engineer and is well known for his discoveries and for the several plants he has built in Poland and in Switzerland.

Interest in management in Poland is centered around the "Institute for Scientific Management," which has been in existence for about two years. It is composed of management experts who are subject to election and at present there are fifty-five members, including thirteen honorary members from foreign countries, six of whom are Americans.

This Institute has published in very creditable form a number of books on management and each month issues a *Review of Scientific Management*. It has organized a series of lectures for engineers and due to its efforts scientific management is now being taught at the Polytechnic Institutes at Warsaw and Lwow, at the graduate schools of agriculture in Warsaw and Dublany and at the Mining Academy at Krakow.

American Methods in Poland

American methods of management are being introduced into Polish industries with good success. There is unfortunately an impression in the minds of some Polish managers, as well as those in other European countries, that American management and mass production mean the same thing, and

that therefore American methods are not applicable to their problems. In Poland they have not the great purchasing power which we have in this country and it is therefore impossible to market goods in such large quantities. As a result Polish plants are smaller than ours and must do more manufacturing to order than producing in quantity. They do not realize that the technic of mass production in this country was mastered years ago and that management engineers during recent years have turned their attention to the more difficult task of simplifying the methods of plants which manufacture to order or produce a variety of goods in small quantities. It is these methods which are most applicable to Polish plants.

We can learn a number of things from Polish industries. Their working hours are shorter than ours, for the eight hour day is universal there. They have made better provision in the way of pensions for retired workers. Their plants are on the average neater and more orderly. They are much more careful to avoid waste of material, and they are more open minded and eager to learn the best ways of doing things.

A month ago at a meeting here, which Mrs. Gilbreth addressed, I made a statement that foreign engineers and managers show a keener interest in American management methods than we show in foreign methods. This is of course largely due to the present prosperity of America—less prosperous nations want to learn how we reached this new level and naturally we are inclined to be satisfied with methods which have given us such good results. Our management is more highly developed and more effective than in other nations, but we should remember that we have had many advantages: peace, natural resources, a pioneering spirit and a freedom for experiment unknown in older countries. Realizing this we should give them freely the best we have developed.

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