

THE RELATION OF MODERN SCIENCE TO NATIONAL PROSPERITY.

Modern science is to national prosperity as knowledge is to power. Of the three great laws which govern our social and political privileges,—the Law of Right, the Law of Cause and Effect, and the Law of Supply and Demand, the second, that of Cause and Effect, bears chiefly upon our theme. Knowledge is the Cause; Prosperity the Effect. This fact is fully demonstrated by the evidences of observation and history. Science, then, which is classified knowledge, is a factor of prosperity.

The rise, growth and power of the great nations for two centuries, and the results of scientific discovery and invention. These conditions are ordinarily due to individuals rather than to classes. Simple facts of experiment and observation are at once accepted and their discoverers duly honored. But the grander efforts in the interests of science require careful thought. For this reason, great scientists, like great artists and poets, seldom reap immediate practical results from their discoveries.

But "Metamorphosis," says Herbert Spencer, "is the universal law." In science, then, change is inevitable. Among some peoples it is more rapid than among others, but no matter what the speed, the ultimate result is progress. Daily observation, and history, which is the record of the ages, teach us the influence of scientific progress upon the civilization and prosperity of the world.

Let us go back to the reign of Edward IV. The printing press, which under William Caxton, began its work in England in 1474, was the most potent means for the extension of the great reformation under Luther and Calvin. What an advance has been made in 400 years. A printing press to-day will print, cut, fold, count and deliver in package, 36,000 complete eight page papers per hour. Who can estimate the result upon a nation, of such a rapid distribution of literature? Education and the printing press advance together.

"Commerce," said Carlyle, "is the life of a nation." England and America are evidences

that this is true. The steam engine accelerated our industries, the cotton gin in a period of one hundred years, increased the exportation of cotton from 8 bales, to 6,000,000 bales.

Eriesson, in his invention of the Monitor, opened up a new scheme of naval architecture. Gunpowder first applied to the art of gunnery at the Battle of Creecy, in 1346, ushered in a new era of naval and military power. What would the soldiers of the German army say, if instead of the rifle, the Kaiser should place in their hands the flint lock musket of a century ago? Or suppose Pres. Faure should provide his troops with cannon used in the French Revolution, instead of the mitrailleuse?

Who doubts that the power of Niagara will soon propel cars from New York to Buffalo, yes, from Buffalo to Chicago? Who doubts that the same power will soon run the motors which produce the illumination of our largest cities in the North and East?

Note the discoveries of Edison. Who will estimate the influence of such discoveries and inventions upon the prosperity of a country? Yet electricity is still in its infancy. Fifty years ago, the people generally, were laughing at Prot. Morse; mark the results of his experiments as seen to-day,—over 200,000 miles of telegraph lines on this continent, and submarine cables to nearly all the civilized countries. The Bell electric telephone, invented in 1874, as now perfected, enables the merchant in Boston to talk with his customer in Chicago. By those and other means there is instant communication with all parts of the civilized world.

We can reach San Francisco by means of the fast train service in four and one-half days. Is it any wonder then, that a country is prosperous, with its streets lighted and street cars run by electricity, and with a thousand common devices, which minister to the comfort, convenience and safety of its citizens? The skill of the mechanic has improved every implement of both peace and war, from the telescope to the cannon. The records of the Patent Office show over 22,000 patents in a single year. And not alone in England and America, but in all the civilized countries, is the increase of prosperity