

The Influence
of
MECHANICAL ENGINEERING
ON
AGRICULTURE

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Table of contents.

Introduction.

Progress from the Colonial days	Page 1
State of industry in	" 2
Work of the inventor	" 2
Three revolutionary events	" 3
Effects of steel	" 4
Electricity	" 5
The Gas engine	" 6
Wind-mill	" 6
Irrigation	" 7
Transportation of water	" 8
Difference in production	" 9
Good roads	" 9
New relation of City and Country	" 10
Better education	" 10
The end	" 10

The influence of Mechanical Engineering on Agriculture

To consider the vast progress made in this art and science, we need not go back to the time of the ancient Romans, but only to the old Colonial days. In those days small log-houses dotted the not much larger clearings. Not very elegant was the appearance of these houses, although they might be called artistic by the artist of the present-day. But those were sterner times when shelter from the storms and protection from the red man were most to be desired. The furniture was plain, home-made, and strong. The large open fire-place lighted the room in the frosty winter twilight, and furnished warmth and means for cooking the food. And on the hooks upon the wall hung the trusty old rifle, which served both as a means of support in supplying food, and a defence against the blood-thirsty Indians.

The lower room served as parlor, sitting-room, dining-room, kitchen, and sleeping-room for the parents, while the children slept in the loft above. Many were the trials of the early settlers, but these hardships made a race of strong men and women, men that loved their

home and country so devotedly that they suffered untold misery that their fireside and native land might be freed from the grasp of the tyrant-hand. This was a time when even in advanced England industry was but in its infancy, while in the Colonies it was in a much worse state of affairs. Most of the industry was carried on in the homes, the settlers made their own clothing, secured their own food, living mostly upon those things most abundantly supplied by nature. Some little cultivation of the soil was carried on but most of the food was gotten by hunting and fishing. The hides of the captured animals were dressed and used for clothing.

But soon the inventive mind of the mechanical engineer began to make itself felt; and machine after machine was planned, built, and brought to a good state of perfection until today we have a vast world of machinery from the simple egg-beater to the highly complicated automatic machines into which the raw rough material is fed and it comes out the finished product. A good example of this last-kind of machine is the printing press into which is fed the blank sheets of paper

at the other end comes out the printed papers cut, folded, and counted, ready to send to the citizen's very door.

Of all nations our engineer is the most particular about his machine. It must run by itself doing the finest grade of work and go as fast as strength will allow. What care be for an extra ton of coal if it will give the required speed and force!

Although great advancement has been made in the past, much is still left undone and for the young grasping mind there is still much to explore. Mr. Cobden stated in the House of Commons that, "our wealth, commerce, and manufacture grow out of the skilled labor of men working in metals."

In the commercial history of the last hundred years are three events that have revolutionized our industry. First the steam engine of Watts, second the introduction of the penny-post by Hill which makes it possible today for us to so quickly send our friends a letter to order goods, to receive our mail and a thousand other little things, and the third and greatest was the invention of means

for the production of cheap steel, which were perfected by Sir Henry Bessemer and Sir William Siemens. Nor is this the only thing Bessemer did, but many other good and useful inventions were the products of his fertile brain. Although the steam-engine and penny-fost were of a vast importance before the time of Bessemer, their use could never have extended so far but for the invention of those means by which the price of steel was lowered from [£]300 per ton to [£]40 per ton, a price below that wrought-iron from which the best of steel is made. This great reduction in cost of material makes it possible to build engines, locomotives and all kinds of machines at a much lower figure.

Cheap steel also made it possible to bind together the numerous countries of the world with bands of steel.

There seems little doubt, that but for the creation of the age of steel this beautiful western country would not be so far advanced as it now is, because the old process of making railroad rails of wrought-iron was too expensive that our rail-roads would

never have been built until the the wealth of the country had become enormous. With-out the rail-roads our mail could not be carried so cheaply, neither could our produce, and in this way our income would be greatly decreased while the cost of bringing things in would so rise the price that we would have to do without many things that now seem necessary.

Other things of vast importance are now being developed. Electricity once a mystery to men, though still but little known is now used in many shops as a means of transportation of energy, but the height of its usefulness has not yet been reached. In the near future the means of transporting electrical energy will be so improved and cheapened that the loss of the fluid will be very small indeed, and electricity will become of vast importance in the transmission of energy, in lighting, in cooking; its use in welding is fast advancing towards perfection.

Electrical welding is far superior to the old way because the heat is greater and can be applied where needed to produce the best effect possible.

It would be hard to say what the future of this force will be. But its advance will no doubt be great, although it hardly looks possible for it to fill the place some think it will, although it is already shortening distance between the farm and the city and bringing them in closer contact.

Another very important force of the present day is gas. The Gasoline engine so much in demand now is a very important machine, and although at present it has many drawbacks we look forward to the time when it will be so perfected as to be of far more economic value than it has been. Today the gasoline engine is made mostly in small horse-powers and has an extensive use in running small shops where light machinery is used. It is not only used in the city, but the farmer also shares in the benefit and his corn-sheller, feed-mill, and hay-press respond to the strokes of the gas engine.

For work where a constant force is not needed the wind mill is the most economical. Those of the past were of rude form, and were not built on scientific principles, but under the hand of the mechanic they have been much improved but are still not perfected as they will be in

the future. There has been much experimenting in this line of work and it has been found that not the most efficient is the best for the market because of the expense of making. But as yet the ideal is not reached. You may ask what is that ideal? It is this. A mill that will vary its stroke as the wind varies; a short stroke in a low velocity and a long stroke in a high velocity wind; a mill strong enough to be held square to the wind except at very high velocities at which time it will swing out of the way.

Why was this country once called a desert? Why are crops so uncertain in the western part of this state at the present day? Simply because of the lack of rain-fall. But when water can be found beneath the surface, raised by wind-pumps, stored in reservoirs, or taken from the streams, and used for irrigation, the yield has been very good, because the soil is exty good and all it lacks is enough water applied at the right time. It has been the engineer who has made it possible to irrigate. At the present time not over one third of the amount of water once thought necessary is used. Irrigation alone is of no good, but if used in co-operation with good scientific cultivation the results are surprising. In this work

the engineer has raised the water, constructed the dams, and the canals; the farm implements are also the products of his fertile brain. Not only have improvements been made in pumps and water supplies but also in the way of transportation of water. If we go back to the time of the Romans we will find that they spent years in building great aqueducts across valleys, which could be piped now in a few days. The time and expense taken to build an aqueduct of any size must have been great and of a consequence their city water supply must have been very limited, and irrigation impossible. But at present the cities are well supplied with good systems of water-works. Pipes used are mostly of cast or wrought iron, but a new system of making pipes of cement, which is very good, not so very expensive, and easy to make.

The effect of all this on the production of the country can hardly be imagined. As before mentioned new methods of tillage must go hand in hand with irrigation. By keeping the top of the soil cultivated fine it keeps the moisture in.

Soil this cultivation helps irrigation.

Many and different products will be raised which this new method will make possible.

More could then be raised on an acre than can be raised on five acres at present, not more of the same product, but more of some products that will give better returns. This change will necessitate smaller farms better worked.

And thus with the larger returns we need not fear the Malthus theory.

In the future the engineer will be far more important than at the present day. There will be a changed social relation between the city and the country. Already the bicycle and motor-cycle have lessened the distance, and started the good road movement; indeed in this work of road building is very necessary. Many farms of roads are built, from the common dirt road to the fine pavement of the city.

One of the things we need most is a good well built, well regulated road system. Nothing would help the farmer more in making his trips to the city and in the transportation of his produce.

As the world advances the relation between

the farmer and engineer will be closer and closer until the farmer by the use of the many machines, good roads and irrigation plants will have his mind so widened deepened that in his work he will find time to enjoy the beauty of nature, and the farmer class will become more intelligent, more social, and they be a new people. Farms close together means more population in the school district. this means a better school and better roads and the City and County will be closer together. The rich of the city will have their beautiful homes in the country out of the noise and dust and smoke. New methods of travel will make it possible to go from the country home in the morning to the office in the city and after the days work is over to return once more to the quiet country home.

Then will it be necessary for the farmer to have a better education so that he can carry on his business run his machinery and be able to make a living. Then will his calling be raised above the common standard.