

# Passing of the Steam Engine.

Observer Bureau, 1417 G Street, N. W., Washington, July 19.

Have we come to the passing of the steam engine?

Eminent engineers and others who are constantly making a study of power plant economies are all answering in the affirmative.

The gas engine, the toy of yesterday, has come into the industrial horizon as the plant of to-day, and already it is rapidly crowding the steam engine back to the junk pile.

So marvelous has been the development of this power producer that the old title, "gas engine," has been utterly insignificant and has almost disappeared. Now the United States, and in fact the whole world, is confronted with the "internal combustion motor."

In hundreds of big manufacturing establishments the steam boiler and the steam engine are being ousted and replaced by producer gas plants with the accompanying internal combustion engines.

And there is a reason for it; in fact, several.

The internal combustion engine has demonstrated its ability to produce from two to nearly three times as much power with a given amount of coal as the steam engine. Not only this, but it has proved that the very poorest coals in the gas producer generate twice the power that the same coal does in the steam plant. Still further it has generated power from lignite (the lowest form of coal) where the lignite has refused to do any work under the steam boiler.

This will eventually mean a saving of millions of dollars a year to the manufacturers of this country. Various estimates place the saving in the country's output at from \$100,000,000 to \$200,000,000.

The people's coal bill in 1905 was \$1,500,000,000. One-third of this, or \$500,000,000, it is estimated went for coal to produce power. Thus it will be seen how important this new fuel will become to those who buy coal for the purpose of running steam engines.

In these days of gigantic industrial endeavor, with the great nations of the earth struggling for supremacy in the world's markets, the prizes will go to those countries that can manufacture the most economically. Realizing this, the manufacturers of the United States are taking an intense interest in the work now being done by government experts in solving the problem of the best utilization of the fuel resources of the country. A better utilization of fuel means more economy in the production of goods and more economy means a larger opportunity for the Yankee manufacturer in the trade world.

The technologic branch of the United States Geological Survey has been engaged for several years testing coals for the use of the government and in these tests the possibilities of the gas engine or internal combustion engine, have been developed to such a marked degree that the entire commercial world is taking notice.

For three years the government experts labored at the fuel-testing plant at St. Louis, Mo., with wonderful results. The plant so far as fuel-testing is concerned has been moved to Norfolk, Va., where the tests are being continued.

The experts at the beginning found they had a most difficult problem on their hands. They found that the losses in the utilization of fuel for the development of power, heat and light were so great that in a ton of coal consumed in an ordinary manufacturing plant, less than 5 per cent of the total energy was available for the actual work of manufacturing. They also found that in ordinary locomotives, only 3 to 5 per cent of the fuel energy is obtained for pulling the train. This is about the same as if the household took a barrel of flour and succeeded in getting out one small biscuit as the entire result.

In the hope of stopping this tremendous waste which is going on, the government experts have been experimenting for some time. A method of combustion which, it is believed, will eliminate this waste, has been found in the gas producer and the internal combustion engine.

Gas engines and gas producers have been in operation in the United States for many years, but the development was slow and unimportant until the government experts proved by tests that soft coal and even lignite and peat could be utilized in the producer. Prior to the year 1904, no one in this country had succeeded in using soft coal and lignite in this way, and with the big prices for anthracite there was but little economy in the gas engine. For many years the natural fuel of these internal combustion engines was city gas, but even this was too expensive except for engines of small capacity. It was seldom found feasible to operate engines of more than 75-horse-power on this fuel.

The theoretical possibilities of the internal combustion engine operated upon cheap fuel promised so much that the practical difficulties were soon overcome, with the result that the internal combustion engine at once became by serious rivals of the steam engine. The development of the gas engine in point of size has been exceedingly rapid. It was only a few years ago that a 500-horse-power engine exhibited at the Paris Exposition was regarded as a wonder, but today, four-cycle, twin-tandem, double-acting gas engines, run as high as 4,000-horse-power.

Robert Howard Fernald, professor of mechanical engineering, Washington University, St. Louis, Mo., and engineer in charge of producer gas tests of the United States Geological Survey, has been conducting an intensive study of the possibilities in this new mode of power production. In speaking of the results of the investigations he paints a rosy picture for the future, not only in the cheapening of production, but also in the abatement of the smoke nuisance throughout the United States, for the producer makes no smoke in its generation of power.

"The value of the results of these investigations is of course not limited to the coal producing section of the country," says Professor Fernald, "but extends through every State and territory where coal or other mineral fuel is used as a source of power. Thus in the New England States no coal is mined, but in the year 1902, the steam power produced through the consumption of coal and used for manufacturing purposes in these States cost approximately \$50,000,000.

The development of this power through the more efficient method suggested by these investigations would mean a saving to the manufacturers in these States of \$15,000,000 to \$20,000,000 per annum.

"Again, the total consumption of coal in St. Louis, Mo., for industrial purposes alone amounts to more than

Operating expense and fixed charges on the 4,000-horse-power producer plant shown at \$14,000,000, while the steam engine would cost \$210,552. The total saving per year by operating the gas producer plant of 4,000-horse-power over the same horse-power steam engine is placed at \$77,550, clearly a figure that would appeal to the big manufacturing interests.

That the United States has not taken up this question too soon is shown in the agitation now going on in Europe against the waste of fuel. The gas engine has already obtained high development in Germany and England, has pronounced its success. An eminent British engineer in discussing the waste of the fuel resources the other day said in a London paper, "It has been estimated that some 52,000,000 tons of coal are annually converted into steam power at mines and factories in the United Kingdom, and that on an average the consumption of coal per indicated horse-power per hour is five pounds. When it is remembered that in an economical plant the consumption should be but two pounds per indicated horse-power per hour, some idea will be gained of the enormous amount of waste that is going on in our industries."

"In other industrial operations, there is probably a further 80,000,000 tons consumed, while for domestic industrial purposes the consumption exceeds 30,000,000 tons per annum. Of this 142,000,000 tons, nearly 90 per cent is wasted in various ways. It is a truism to state that the backbone of our having enormous supplies of coal at our doors, and that our industrial position as a nation must suffer in the long run in proportion to the amount of waste that is so carelessly squandered."

James McKechnie, engineering director at Barrow-in-Furness in a recent lecture at the technical college, Glasgow, referring particularly to the application of the gas producer engine for power purposes, estimated that the gas engine, if universally applied, might result in the saving of \$50,000,000 in the annual coal bill of British factories and also that the waste heat from metal furnaces might produce gas enough to run continuously engines of 500-horse-power.

Prof. F. W. Bursall, in lecturing recently before the Society of Engineers, Iron and Steel Institute, England, that the large gas engine had become a commercial success on the continent and no doubt it would ultimately achieve equal success in England. In tests he conducted, the gas producer used but one-third as much coal as the steam engine.

### MAKING A NEW LANGUAGE.

Norway Would Like Something Better Than Made Over Danish

Boston Transcript.

Norway has a new king. That is, he is comparatively new. Some of the varnish may have rubbed off by this time; but to all intents and purposes the king is new.

Norway now wants a new language. The national parliament passed a bill authorizing the change, though has not yet advertised for bids or let the contract. Indeed, there seems to be a disposition to make the new language out of old materials. This will be a great saving, which means some little to a country with the slender purse of Norway.

It seems that the present written and spoken tongue of the country is a made-over Danish. There have been some very slight modifications in pronunciation and the grammar, but Danes and Norwegians understand each other at once, and the literature of the two countries are really a unit. But from this broadening of the vocabulary, there have arisen a host of dialects, dialects that vary so much that peasants from one end of the country talk Greek to peasants in another end.

These tongues are rich and racy, they are alive, they grip the soil and they throw their words.

Fifty years or more ago there came into fashion an effort to preserve these tongues in the country's literature. The written language began to gather up quantities of expressions from speech terms. Bjornson headed the movement and started the fashion, and his books borrow some of their remarkable qualities from this broadening of the vocabulary, which was carried with it broadening of interest and sympathies.

From these healthy beginnings there grew up a widespread endeavor that soon overtook itself, became an exaggeration and received its proper epithet in "maastrichtism." From the enthusiasm passed to the point of attempting an entire upheaval of the language. Bjornson suddenly became a pariah and an agent against this tide of wholesale lexicological fanaticism.

Now it is quite possible that some change may actually appear in the Norwegian tongue. Parliament has voted that examinations in the Norwegian vernacular shall be imposed upon pupils in the schools along with study of the existing forms of speech. The peasant really forced this measure through. They hold a large hand in the national assembly, and their vanity had been rebuffed when they found they had been called upon to supply their land with a language. First the "Landmaal" was recommended as a study. Then it was made optional. Soon teachers were required to possess very good knowledge of it. Now the last step in this act, which compels the pupils in the secondary schools to learn two Norwegian languages, one with a literature and good for every day use, the other a product of pedantic philologists. The "Landmaal" has divided in an artificial effort of the linguists, who, in their passion for order and exactness, have robbed the poor thing of its original life and vigor.

There is in Norway an exaggeration of the nationalistic idea. There is a tendency to exclude foreign capital and foreign enterprise. This language deal seems another ultra-nationalistic extravagance that may lead to the temporary ecstasy of temporarily predominant peasants. The whole future of Norway consists in its Europeanization.

Presence of Mind.

A negro minister from Georgia, who was visiting in New York city, went one Sunday to the cathedral on Fifth avenue.

He was very much impressed by the service, especially by the now the professional and recessional. When he returned to the South he resolved to introduce the same thing in his church, so he collected 10 or 20 little darkies and drilled them until he had them well trained.

One Sunday the congregation were greatly surprised to see the choir boys marching in, singing the professional. The minister noticed that something was wrong, but he kept on carrying anything. He leaned over the pulpit, and in order to avoid attracting attention, he continued in tune to the song they were singing.

"What—have you done with the increase of?"

"The little darkies, with great presence of mind, chanted back:

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### PLAYS OF NAPOLEON.

THE COUNTESS DE LAPEYROUSE

She was the daughter of Gen. De Montholon, H. H. Master's Comrade and the daughter of General De Montholon, the faithful companion of his master at St. Helena, where she was born a year after the battle of Waterloo. The fallen Emperor was her godfather, and he was her daily comrade and chief playmate until his death. Wherever one's world was limited, even the memories of an alert child of five years have their value. In her old age the Countess de Lapeyrouse—her married name—always repeated the same things in the same way, not for the purpose of which seems to have forgotten her until her death, but to the friends who were always asking her about the great man. It was Beranger's song over again. "Vous l'avez vu, grandmere? vous l'avez vu?"

Jacques Normand, whose literature makes him sympathetic to such purposes, talks at length with this notable lady during one of the bright days of her life-end.

"I have had nine children; five are living. With the years my health has improved; it is excellent—that is, for my age. I have never a cold, my sight is perfect; the same number of glasses since I was 60. I read without trouble and without getting tired. As to memory, it comes and goes—one day very clear, not so the day after. Yesterday I remembered well the exact number of the feet of HE WAS NICE ABOUT HIS FEET.

"And do you remember him well to-day?"

"Yes, well, really, well. Only think! I was born at St. Helena; he was my godfather. When I was little I saw of him all the day long—he was so full of him. I still see him in his uniform of the Chasseurs de la Garde, it was that he liked best; also in the morning in a dressing-gown of white cashmere. He was very nice about that, they were very pretty, and he wore shoes with buckles, and used to come early trotting into his room. There was a bed with blue curtains trimmed with yellow. The Emperor jumped me on his knee—walk! trot! call! I laughed like mad, and he said, 'See that I kiss him simply good. And then his voice—I hear it still. It was well toned (timbre), without the slightest accent. Why, if I should hear that voice behind me after all these years, I should know it at once!'

"Would you like to see his sword?"

The aged playmate of the great man interrupted. It was a triangular blade of blue steel, with gold damascene work and an eagle at the guard. The sheath was in worn leather, with a belt of black cloth, also much worn, with brass rings.

"I sometimes kiss it," said the old woman simply.

DID NOT LOOK AN OLD MAN.

"The Emperor did not have the look of an old man, nor of a worn-out man. He was very strong up to his terrible ailment—a cancer of the stomach (pylorus). It was a disease made over his father and mother in both of them. He had already had some warning of it, but had resisted. Then the last attack came suddenly during a carriage drive with my father. The Emperor had the carriage stopped, he suffered so keenly. After that the trouble kept growing worse—and he died in spite of the devoted care of Antommarchi. As you know, the Emperor died a Christian in the last period of his life he had become very religious, and scrupulously fulfilled his duties as a man. The only thing he was very often repeated a phrase about Marie Louise, whose abandonment of him was very painful to him: 'Ah! my good Josephine would not have left me like that.' Yes, I can still hear him saying that!"

The aged Norman asked a leading question, to which the reply, after all these years, has still an historical value.

"Do you remember Sir Hudson Lowe, madame? He was very cruel to the Emperor, was he not? A sort of executioner and a murderer."

He took pains to note the exact words of one who, however young, was able to have living impressions of what really took place.

UNJUST TO LOWE.

"Do I remember Sir Hudson Lowe? Yes, I saw him many times with the Emperor, talking with him. An executioner, but the people have been very unjust toward him, very unjust. He was 'correct', he executed orders without adding any of his own. Certainly the Emperor did not like him, he could not like him; it was England he hated in him. But he did justice to the man, to his general conduct and bearing. For example, he could not endure every day it made him angry—that Sir Hudson Lowe should call him 'general' and not 'sir'. In that, as in everything else, Sir Hudson Lowe only executed orders which he had very good knowledge of. When he landed after leaving St. Helena, we were very well received. But what astonished us greatly was that Sir Hudson Lowe was already detested by Englishmen. The part he had to play as a jailer mortified them, and even his manners had to bear the opprobrium of the great Emperor."

M. Normand adds: "From this visit, almost in extremis, I keep so lively an impression that I have tried to share it with all those who interest themselves passionately in whatever touches near or remotely in the memory of the great Emperor."

### Wild Weeds of Great Value.

New Orleans Times-Democrat.

New Zealand flax is one of a number of wild weeds that yield their gatherers great wealth. This flax, the strongest known, grows wild in marshes, and is cultivated in England and its fibres become brittle and valueless.

Indian hemp grows wild, and out of it hashish, or keef, is made. Keef looks like flakes of chopped straw. It is smoked in a pipe, and is seen on the liver; it is drunk in water, it produces an intense, a delicious happiness, and among Orientals it is almost as highly prized as beer and whiskey with us.

The best nutmegs are the wild ones. They grow throughout the Malay Archipelago.

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