VALUE OF BY-PRODUCTS IS ALMOST CLEAR PROFIT FORTUNE MADE FROM CHIPS

(New York World)

Here is the story of one small part of the huge independent industrial principality which Henry Ford established in the United States.

It is fairly well known that Ford's 158,000 employess bringing coal, iron and lime from his own mines, run his own blast furnaces, man his own ships on lakes and seas and operate his own railroad, his own planes, his own power, gas and fertilizer plants and sell hundreds of articles other than motor cars and tractors.

Because of his aversion to Wall Street and all it stands for, and his horror of debt or dependence upon any one else, Henry Ford built up the largest individual organization that has ever existed on earth. The "Morgan Group," through interlocking directorates, controls the American Telephone and Telepgraph Company, the Pennsylvania Railroad, the United States Steel Corporation, the General Motors Company, the du Pont Industries, the General Electric Company and dozens of other industrial giants. But this is a group of scores of men with no recognized head or owner.

Henry Ford stands alone. He and his son Edsel own all the stock in his organization. He is the world's richest man, worth over a billion. Rockefeller and Morgan stand beneath him in the tabulation of individual wealth.

Makes "Worth" $13,000,000

It is a little known but significant fact that today Henry Ford is making forty-four by-products worth $13,000,000 a year out of waste.

An item of $13,000,000 for by-products looks small in an organization with an annual gross of over $500,000,000; an organization which has supplied more than half of the 23,000,000 automobiles on the road in the United States today, and over 80 per cent of the tractors on the farms; an $120,000,000 a year worth of accessories for the "obsolete" Ford model T.

But that same $13,000,000 for by-products is practically clear profit, made from materials which would normally have been thrown into the junk heap, and which are scrapped by other motor manufacturers. It does not include the millions that are saved every year and gas and other by-products that are used within the Ford organization.

The real significance of the $13,000,000 by-products item lies in the fact that it epitomizes the Ford policy and brings into the spotlight the results attained by Henry Ford, the greatest eliminator of waste American industry has yet seen.

Everyone knows that Ford's fortune was built on the Model T. Ford, which brought the automobile within the reach of the average man. Simple building, elimination of waste, and utilization of every bit of power were responsible for the sensational success of that model. The flywheel in the motor was an example. Other automobiles had elaborate lubrication systems, magnetos, gear shifts and cooling systems. The Ford flywheel was all of these. It slashed oil through the motor. The magneto was within it. The gear shift was behind it. The same wheel turned the fan.

Still Depends on Newark Manufacturer

The same principles were contained in the Fordson tractor, which has become a universal portable power plant in use throughout industry.

In the beginning Ford bought most of his parts, merely assembling his automobile. As his fortune increased he put it back into his works, gradually gaining control of the raw materials that he needed. He bought coal and iron mines and limestone quarries and eliminated the profit he was paying the vendors of these raw materials. Then transportation engaged his attention and he bought his own ships, and his own railroad, the Detroit, Toledo, and Ironton.

Then lumber, gas and power took his attention. Ford bought glass works, forests, lumber camps and power sites. Farm problems interested him next. He purchased large areas in Michigan to work out his ideas of "doing a year's work in twenty days" through scientific application of power, and incidentally, to serve as a testing laboratory for ammonium sulphate, the Ford fertilizer, which is, strangely enough, a by-product of the manufacture of Ford automobiles.

Ford is not yet entirely independent of other manufacturers. For example, a Newark manufacturer still makes tops for some of his models, and he buys the tires that go on his new automobiles. But he is more nearly self-contained than any other American man of large industry.

The story of Ford's by-products has proven fascinating to mechanical and chemical engineers who study its technical porblems. Just how Portland cement, coal tar dyes and farm fertilizer may come out of the manufacture of Ford motor cars mystifies the layman. A trip through the Ford cycle of manufacture would explain it. It would also explain how raw iron ore is transformed into a finished automobile in fifty-two hours, a process which, up to 1920, took twenty-one days.

Here is Ford Cycle of Production

Let us assume that the visitor arrives at the Ford plant on Monday morning. The production cycle illustrated is that of the old model Ford. It has not yet become perfect with the newer car, which is being produced at the rate of 500 to 600 a day, with the hope that production will reach 2,000 daily by the end of April.

This is the production cycle:

Monday, 8 A. M.

1. After a trip of forty-eight hours from the Ford iron mines at Marquette, Mich., the Ford ore boat docks at the Ford docks at the Fordson Mich., plant. Hulett unloaders start removing the cargo, which is transferred to the high line, and from there to the skip car which charges the blast furnace. By continuous process this takes ten minutes.

Tuesday, 12.10 A. M.

2. Sixteen hours later the ore has been reduced to foundry iron. It is then cast into pigs and sent to the foundry, where, mixed with certain proportions of scrap, it is remelted. This takes about four hours in all.

Tuesday, 4.10 A. M.

3. As the conveyor brings the moulds past the pouring station hot metal is cast into cylinder blocks. These then go to the shake-out station and are taken away to cool and be cleaned. The cooling and cleaning process requires about five hours.

Tuesday, 9.10 A. M.

4. The casting now goes to its first machining operation. There are forty-four operations in all, all of which are done in apporximately 100 minutes. All these are performed in the foundry building—a departure from conventional foundry practice but in line with the Ford method of continuous operation.

Tuesday, 10.50 A. M.

5. About 10.50 o'clock the motor block is ready for the assembly line. Ford mechanics have reduced the time required for motor assembly to an average of 121 minutes. This includes everything, from, even an electrically controlled block test. Except for running in the motor to loosen it up, everything is done "on the move."

Tuesday, 12.50 P. M.

6. The finished motor coming out over a trunk line conveyor is loaded into a freight car with the aid of the device illustrated and shipped to a branch for assembly into a finished car. A constant stream of freight cars leave the plant day and night.

Wednesday

7. Arriving at the branch plant the motor is unloaded and sent to its station on the final assembly line. These assembly lines are standardized the world over and represent specialized workmanship at the peak of efficiency. In four hops the car is ready to be driven away.

Wednesday, 12 Noon

8. Long before noon the dealer will have taken delivery of the car and paid for it. In the case of driveaways the dealer often brings his customer to the plant and closes the deal then and there. Here is a conversion of raw material into cash in approximately fifty-two hours. Of this fifty-two hours, fifteen are consumed in shipping and handling. Even this record-breaking cycle is often shortened, for if the Detroit branch had made the assembly, much of the shipping time would be saved.

Records show that more than 500,000 tons of iron ore are used in the production of Ford cars annually; that approximately 100,000,000 board feet of lumber and 20,000,000 square feet of polished plate glass are used, and that the various manufacturing processes require the use of 1,700,000 tons of coal. All these are Ford products and it is from them that the by-products are salvaged.

It is the blast furnace that is the keystone of the by-products industry. Naturally its chief product is pig iron, steel and tinplate for the production of automobiles. But in its operation it gives off gas and requires the coking of coal. This produces a multitude of by-products. Some of the gas is burned in the factories. Some of it is sold commercially. Part of it goes into the manufacture of ammonium sulphate, the fertilizer which is distributed through Ford dealers. It contains a high percentage of soluble nitrogen. Hundreds of coal tar products could be made from the tar which is produced in the coke ovens, but most of this is burned as a fuel, the financial profit being greater.

After the ammounium sulphate has been made from the surplus oven gas in saturttors that portion of the gas which continues is washed with cold water and from it napthalene is recovered and sold to moth ball manufacturers. The gas next goes through tall scrubbers, where it is washed with mineral oil to remove crude light oil. The mineral oil containing the crude light oil is idstilled directly with steam and neutralized with caustic sulphuric acid. The neutral oil is distilled indirectly and furnishes refined light oil. This is further fractionized and made into motor benzol, an airplane fuel. Toluol, xytol and other by-products could be made, but all the refined light oil is now being used to manufacture benzol, which, when completed, is one part light oil and three parts gasoline, and acts entirely like ethyl gasoline.

A Fortune from Chips

After the pig iron has been pored off the blast furnaces there is a waste slag. In order to utilize this slag the Ford Motor Company has erected one of the most modern cement plants in the world, producing commercial Portland cement. The cement is made by wet grinding granulated slag and limestone.

One fifty of the annual production of plate glass, or 23,000,000 square feet, is made in the four Ford plants. Two of the plants operate in Detroit, one in St. Paul, Minn., and one in Glassmere, Pa. A multitude of by-products comes from this manufacture.

At Iron Mountain, Mich., in the hardwood district of Northern Michigan where the factories receive lumber, Mr. Ford has erected an enormous distillation plant for the purpose of utilizing the waste wood and converting into such useful products as charcoal and industrial chemicals. The method of conversion is known as the Stafford process. It permits the use of chips, small edgings, and a certain amount of sawdust.

Ford charcoal briquets are the chief product of this plant. They are used in railroad dining cars as a concentrated fuel and in many branches of industry.

While the wood is being carbonized for charcoal a gas is given off which is condensed to a raw liquor. This contains soluble tar, settled tar, acetic acid, methyl alcohol and water. The acetic acid is made into calcium acetate and ethyl acetata. The alcohols are made into methyl alcohol, methyl acetone and allyl alcohol. Hardwood pitch, wood creosote oil and calcium acetate are other by-products. Ford literally picks a fortune out of chips.

So extensive has become the Ford by-products business, that out of the manufacture of automobiles the following materials are sold in the open market.

Ford Motor benol, ammonium sulphate, coal, naphthalene, Portland cement, charcoal briquets, hardwood tar, hardwood pitch, creosote oils, flotation oils, lime lee oil, methanol, ethyl, acetata, methyl acetone, calcium acetate, plate glass and scrap of all kinds. Other products are sold privately.

Henry Ford talks for hours about his salvage of industrial materials. Then he points to his Human Salvage Department, in which persons suffering from amputation, nervous and mental diseases and other illnesses are made over into healthy self-supporting persons. But that is another story.

HIS HONOR'S SPEECH AT PROROGATION

Refers to the Important Legislation Enacted During the Session.

Mr. Speaker and Gentlemen of the Legislative Assembly:

While the Session has been a short one yet much business has come before the House which has required and received unremitting attention. In view of the recent revision of the Statutes no important change has been sought in public elgislation, but many instances have arisen where the revision by presenting the law in a succinct form has called attention to the need of minor amendments which you have adopted.

Experience under the Liquor Control Act of last session has shown the necessity of amending that measure so as to render the enforcement of the Act more certain. You have provided, I think, means by which objections to merely technical procedure will no longer be successful in such litigation and that nothing but an honest defence will avail a person who is accused of an infraction of the law.

The establishment of a Provincial Police Force has accomplished much for the enforcement of law and order, and I feel that as this force is brought up to strength and acquires proper training it will still further demonstrate its utility.

The adoption of the Long Term Credits Act will enable this Province to cooperate with the Dominion in extending to farmers a form of credit which they cannot obtain from ordinary financial institutions.

The provision of greater accommodation for forestry and mineralogy in connection with the Provincial University marks the co-relation which should exist between that institution and the development of the natural resources of the Province.

I thank you for the liberal provision which you have made for the service of Agriculture, the construction of roads and public services generally. The assistance which you have given to those unfortunates who require to use sanitariums for the treatment of tuberculosis will be much appreciated not only by the patients but by the municipalities which thereby obtain an appreciable measure of relief.

The outlook for development in the Province in industries depending upon our Crown Lands is good. The power at Grand Falls will be available this year for assistance to that class of industry and it appears probable that considerable enterprise will be displayed in connection with our mining possibilities.

I wish our people all success in their efforts toward progress, material as well as social, and trust that the blessing of God may abide upon them and those engaged in the public work which is so esential to the public welfare.

WILL ENDEAVOR TO RAISE AN ENDOWMENT FUND OF $30,000 FOR THE ADULT BLIND

Mr. Wm. McT. Orr, of Halifax, who has accepted the General Chairmanship of the Campaign to raise an Endowment Fund of $300,000 for the Adult Blind of the Maritime Provinces and Newfoundland, has announced that plans are being rapidly developed for the organization of over one hundred communities in preparation for the canvass for contributions which is to be made during the week beginning May 28th.

In speaking of the aims of the Institute, Chairman Orr said that they may be summarized as follows:

"1. Field work and registration of all blind people within the territory.

2. Home Teaching to adults of light handicrafts, and of raised point reading and writing.

3. Vocational Instruction given in our Central Workshop.

4. Vocational Employment on a wage basis.

5. Salesroom. A department for the distribution at cost of raw materials to blind persons working in their own homes, and the selling of their finished products.

6. After care. In regard to the placing in employment or the starting in business of blind persons, along other lines than those undertaken in our regular workshops.

7. Library and Publishing Department. For the publication and free circulation of literature for the blind.

8. Prevention of Blindness. A campaign in all its aspects for the prevention of blindness and the conservation of the sight of the semi-sighted."

"It is estimated," continued Chairman Orr, "that it will require $25,000 a year to carry out the projected programme. The Institute receives approximately $10,000 a year in governmental and municipal grants and the balance of $15,000, it is expected will be provided by the income from the $300,000 Endowment Fund. It is estimated that one out of every one thousand of our population is blind. How little sacrifice and co-operation on the part or each seeing person is necessary to enable us to fully achive our objective."

'Ie is expected that through this one effort, sufficient revenue will be insured to finance the work for the Blind for some years to come, and that it will not be necessary to make an annual appeal for this purpose."

The movement will be under the patronage of His Honor, The Honorable James C. Tory, L. L. D., Lieutenant-Governor of New Brunswick, His Honor, the Honorable Frank R. Heartz, Lieutenant-Governor of Prince Edward Island, the leading clergymen of all denominations, well known educators and prominent men and women throughout the Maritimes and Newfoundland. Honorable J. Fred Fraser will be the Honorary Provincial Chairman for Nova Scotia, Sir J. Douglas Hazen, Chief Justice of the Province of New Brunswick, will be the Honorary Provincial Chairman for that territory. The Honorary Provincial Chairman for Nefoundland and Prince Edward Island will be announced shortly. A local chairman will be appointed for each community and he in turn will organize a corps of men and women workers who will conduct the canvass for subscriptions. The organization of these local committees is now under way.

H. O. Davis of Moncton is in the city today.