Den traditionelle jernindustri i Kina og dens moderne skæbne

Donald B. Wagner

The New Trend in Local Steel Manufacture

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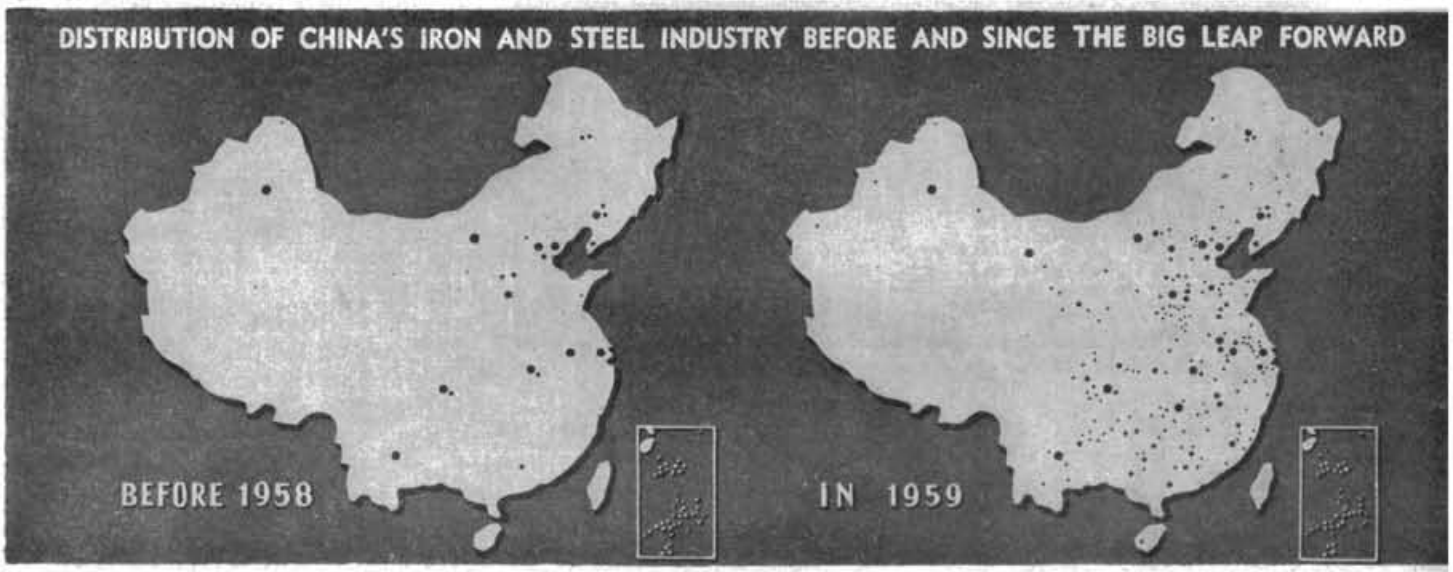

Sketch map, boundaries not precise. *Mi Wen-huan*

In the nationwide campaign for the manufacture of iron and steel during last year's great leap forward, tens of thousands of small, simple furnaces were built by ordinary people, farmers and others, all over China. Together they turned out over three million tons of steel, a big contribution to 1958's doubled steel output. In addition, they laid the basis for a transformation in the geographical distribution of China's iron and steel industry. Formerly such industry existed in only nine provinces or municipalities; now, practically every province and autonomous region has the foundations for its development.

The initial growth was followed during the winter and spring by a whole process of readjustment, consolidation and technical improvement. Many scattered units were brought together into permanent small-scale iron and steel plants, close to the best sources of raw material. With an estimated output of some ten million tons of pig-iron, the small furnaces will this year account for almost half the national iron supply, while the Bessemer converters are expected to turn out about four million tons of steel (which is not to be counted in the state plan but will be at the disposal of local authorities).

This new, permanent network of local iron and steel production is playing a big part in the technical revolution in agriculture and the small industries run by the people's communes. Its development is a logical advance from the earlier mass campaign, which revealed the existence of hitherto-unknown mineral deposits, provided a training ground for a skilled labour force to man the larger plants, and produced the iron and steel required to make the equipment for them. Below is a report of the growth of one such local enterprise.

THE first time I visited the Fenghuangwo iron and steel works was in November 1958, when it had only been established one month. At first sight it appeared to be just a group of ordinary single-story brick sheds. Yet it was already turning out iron, rolled steel and even manufactured metal goods. Situated on the outskirts of the county town of Macheng in Hupeh province, it had been located there because of the discovery during the steel-making campaign of large quantities of rich iron-content sand in the nearby Taolin River. Its brief but exciting history was related to me by Chang Teng-hwa, the works' Communist Party secretary.

Three months previously the 13,000 local peasant households, newly organized into a people's commune, had plunged eagerly into the campaign for making steel. They went out prospecting for mineral resources, built hundreds of small furnaces and within three months had produced 700 tons of pig-iron and 100 tons of steel. Then they seized on the bold idea — put forward by the commune's Communist Party committee — of setting up a permanent small iron and steel combine using these newly-discovered resources to make tools and equipment for agriculture and local electrification, serving the county as a whole.

Fenghuangwo was selected for the site, and nearly everyone in the county took some part in the building, which was done voluntarily. Led by the head of the county government and the secretary of the county Party committee, farmers and their families

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cleared the ground and carried building materials; truck drivers delivered bricks and tiles in their spare time; the county's 120 professional building workers erected the three rows of single-story workshops in one week; telecommunication workers installed telephones and wiring; and meanwhile all the available steel-making equipment was concentrated and the best types of local furnaces rebuilt at the site. Seven days after the ground was broken, iron was being tapped and steel poured there.

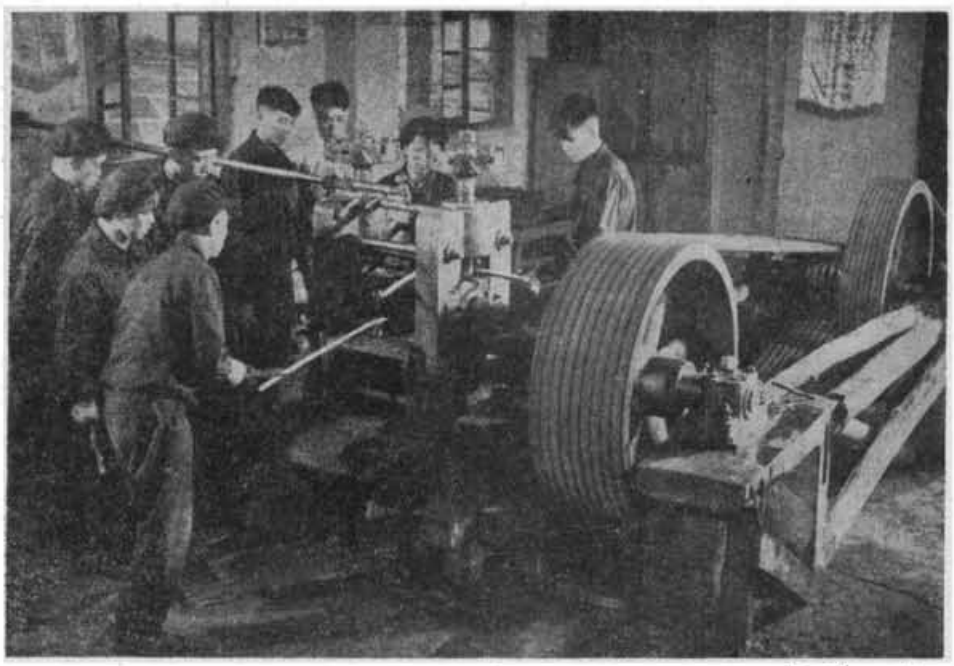
Early Growth

The biggest problem was to get rolling equipment. From the nearby Wuhan Iron and Steel Company, they purchased a 180-mm. rolling mill, made to a standard blueprint issued by the Designing Institute of the Ministry of Metallurgy for the many local steel plants that were springing up. Weighing about one ton, this can be fitted with a variety of rollers to shape out steel plate, rods, square-section bars and wires. Immediately after it arrived, the local machine shop set to work to copy it, using the locally-made iron and steel. By the time of my visit, this "twin brother" was working successfully alongside the original model.

The great majority of the work, however, was still being done with "home-made" equipment and what are called "indigenous" methods. Smelting was going on in three earth-built 0.4 cubic-metre blast furnaces, which were turning out 12 tons of pig-iron a day. This was being turned into low-carbon steel in two earth and clay-brick low-temperature furnaces, tended by a group of young peasant women. In the hot-working section, bars hot from the furnace were being hammered, either on anvils or under a crude drop-hammer operated by two men with ropes and a pulley.

Each of the two rolling stands was operated by three men, two manipulating the red-hot ingots with tongs and the third adjusting the rollers to successively smaller gauges as the ingots went back and forth through the grooves. The mill had already reached a daily output of more than a ton of shaped steel — in the form of rods with a diameter of 6 to 12 mm., slabs, square bars with a cross-section of 12 to 18 mm., or plates 1.5 cm. thick. An annual total of 1,000 tons of rolled goods was this section's planned capacity.

Finally there was the manufacturing workshop where spades, saws and other tools were being turned out on home-made machines built mostly of wood, and 1 to 3 mm. wire was being drawn, stranded into cables and ropes, or turned into hand-finished nails.



Yu Cheng-chien

The 180 mm. rolling mill, shown above in operation at the Fenghuangwo works in Hupeh province, can be adapted to turn out a variety of products. It was specially designed for small steel plants.

Yang Li-men

One of the steps to modernization: setting up a new Bessemer converter at Fenghuangwo.

Yang Li-men

Steel produced at Fenghuangwo has already gone into making the ploughs and cotton gins above and other items for local use.

Everything was somewhat rough and ready, but quite effective. "Though the sparrow is small," said Chang Teng-hwa, using a familiar Chinese saying, "it is complete in every part."

Modernization Begins

I did not find the opportunity to return to Fenghuangwo until seven months had passed. When I next went there, in September of this year, its transformation into a modern-type small combine was well under way. Smelting was now being done at a separate ironworks located nearer the river where the iron-content sand was plentiful. There the earth furnaces had been largely replaced by a number of small modern ones, each with a capacity of 3 cubic metres, with automatic charging and power-driven blowers. A few of the old-fashioned earth furnaces were still operating; experience and advancing skill, the workers told me, had brought the quality of the pig-iron they pro-

Tang Mou-lin

The earthen furnaces grow up: the iron and steel works operated by Chiaotso city, Honan province, is typical of the small combines which have been set up all over the country in the past year.

duced up to the standard of that made by modern methods, containing only 0.005 per cent sulphur and 0.34 per cent phosphorous.

At Fenghuangwo itself, a new building was being constructed to house a Bessemer converter with a capacity of half a ton per blow. In the rolling-mill the workers were preparing to set up a new 250-mm. rolling stand, made in the local machinery plant from their own iron and steel. All this was part of the logical advance — from "home-made" to modern methods, from a lower stage to a higher, from the popular to the specialized.

As soon as I went into the rolling-mill I noticed that the old hand-operated drop-hammer was no longer in use. The red-hot metal, after a rough beating on the anvil, was being fed directly into the rollers. The works director, who was showing me round, explained the reason for this.

In the previous March, while production was still mainly at the "handicraft" stage, the pace of work at the rolling-stands outstripped the capacity of the drop-hammer to furnish enough wrought-iron ingots. The workers tried to remedy this situation by fixing a motor to the drop-hammer, but though this raised efficiency many times it was not satisfactory. The motor — an old one which had been repaired — frequently broke down and time was lost getting it started again. The head of this workshop, Wen Chia-kuan, puzzling how to overcome this difficulty, hit on a bright idea. He had often noticed that as the ingots went through the rollers a further quantity of slag, not already squeezed out by the drop-hammer, was got rid of. Why not combine the hammering and rolling into one process? He consulted the Party secretary, who suggested that he should prepare a blueprint.

Before the mass steel drive a year previously, Wen Chia-kuan had never seen a rolling mill in his life — he was simply a country blacksmith who had become a skilled steel-worker in the course of the campaign. Nevertheless, he drafted his blueprint and consent was given for his idea to be carried out by the machinery plant. It was not successful at first — when the ingots went through the new roller they frequently stuck. But after he had adjusted the shape of the groove, everything went smoothly and the metal that emerged was as satisfactory as that which had before been hammered. Wen Chia-kuan's innovation is reckoned to have saved 13,000 man-days on that job and about ¥270,000 for the country.

Degree of Mechanization

One of the foremost impressions of progress that my second visit brought was the fact that all the main production jobs were now mechanized. Even the nail-making and wire-drawing were being done by power-driven machines. This had led to such an increase in productivity that 170 out of the former 300 workers had been freed to go back to farm work.

In its first nine months' operation, the director told me, this small iron and steel combine had turned out 210 tons of pig-iron, 329 tons of steel and 194 tons of rolled steel, which had been further manufactured into tools and other commodities — spades, picks, nails, saws, scissors, even zip-fasteners and hair-grips.

The local people, the director told me, had given the mill the name of *Ming Kentze* ("Root of Our Life"), and it was already playing an important part in the development of local industry and the technical revolution in agriculture, replacing iron implements with steel ones, replacing human with animal-propelled transport and implements, and furthering the advance of semi-mechanization in farming with machines for rice-sowing, peanut-shelling, electrically-operated saws, lathes and so forth. During the spring water-conservancy drive it had turned out steel axles for some 300 carts, and done a rush job making thin steel plates to surface the wooden rails for a hauling system on a reservoir project that had enabled earth-shifting to be done 30 times more efficiently than with manual labour. The mill is serving local electrification by processing copper wire for telephone switchboards and other apparatus, and has provided silicon steel plates as well as the wiring for motors and generators at the small power station set up by one of the communes — now using electricity to process agricultural products and light the people's homes for the first time.

Fenghuangwo is only at the beginning of its transformation into a modern iron and steel combine. When the Bessemer converter and the new rolling mill start operation, output of manufactured goods will double its present level, it will make a much wider variety of rods and steel plate — and also 50 to 150 mm. welded tubing. It is calculated that it will then be able to meet at least 70 per cent of local needs in amount and variety of steel goods turned out.

A modern plant is coming into being, which started from nothing and is a monument to the tremendous release of creative energy brought about in the great leap forward and by the people's determination to advance at full speed, leaving the old poverty far behind.