

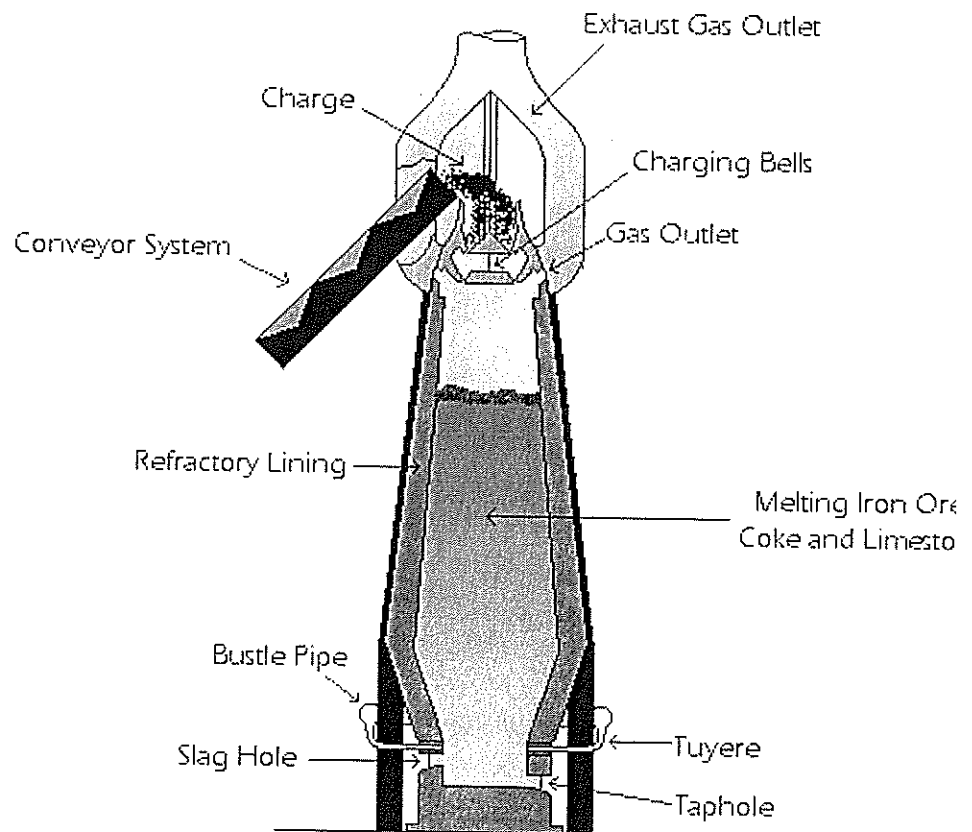
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## Metalwork - Materials - Blast Furnace

Iron Ore is smelted in the **Blast Furnace** in order to remove unwanted impurities such as rocks, and also to separate the Iron from the Oxygen. The result is Iron which is about 95% pure. Impurities are other elements which can be removed later if necessary. A Blast Furnace is about 100m high and produces about 1000 tons of molten Iron a day. It is made from steel. On the diagram below of the Blast Furnace Process, just click on the labels for a more detailed description. If you scroll past the diagram you can read a more detailed description of the Blast Furnace Process.



### The Blast Furnace Process

1. The Iron Ore, Coke and Limestone, (the Charge), is conveyed to the top of the Furnace.
2. The Charge is stored in Bells until the timing is right for the charge to be dropped into the Furnace.
3. Hot air is then blown through pipes called Tuyeres, to fire the mixture.
4. The Coke burns to increase the temperature in the Furnace.
5. The Limestone attracts the impurities in the Iron Ore and forms Slag. This Slag is lighter than the molten iron.

# HOW RICH WERE YESTERYEAR'S RICHEST?

A century ago, when America's entire gross national product was less than \$15 billion a year, ten-figure fortunes were but dollar signs in the eyes of dreamers. If \$1 billion was wealth beyond imagining for most people, a mere \$1 million had meaning—especially in an era when a laboring man earned about 20 cents an hour. Recompute the wealth of some 19th-century millionaires in current dollars, however, and many would qualify for FORTUNE's list of billion-

aires. In 1913, right before the breakup of the Standard Oil trust, **John D. Rockefeller** was worth \$900 million. Adjusted for 75 years of inflation, that translates into \$10 billion. Thus, on today's billionaires list, Rockefeller would rank right after the Mars family, the richest Americans, rather than in the middle, as do his grandchildren David and Laurance.

Yesterday's numbers fall especially short in conveying the importance of these men and women to their time. Ernest and Julio Gallo may supply our wine at dinner; Forrest Mars, our Milky Ways for dessert. But 19th-century moguls industrialized America. They built and financed the nation's railroads, steel mills,



Banker Andrew Mellon

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and oil refineries. "They were obsessive and single-minded," says Yale historian Peter Dobkin Hall. "And they were in the right place at the right time."

Consider the relative magnitude of the Vanderbilt fortune in 1890. By then **Cornelius Vanderbilt's** son, William Henry, a Wall Street investment banker, had nearly doubled what the patriarch left when he died 13 years earlier. The family's \$200 million amounted to nearly half the total receipts of

the U.S. government in 1890, and more than the national investment in public school education that year.

Small though it was, the economy generated enough trinkets to satisfy the most acquisitive early tycoon. **J. P. Morgan** would have put Donald Trump to shame. His 302-foot yacht, *Corsair*, was 20 feet longer than *Trump Princess*. Every summer the Vanderbilts escaped their stuffy block-long abode on Manhattan's Fifth Avenue for the good salt air of Newport, Rhode Island, where parking was never a problem: Their garage housed 100 autos. Once at their airy, 110-room cottage, they could freshen up in one of 45 bathrooms.

Tightwads were not born yet either. Frugal **Henrietta Howland Ison Green**, investor and loan shark, would have made Wal-Mart's Sam Walton look flashy in his pickup truck. She wore the same tatty black dress so that it eventually turned brown, green. Known as the wizard of Wall Street, Hetty amassed \$100 million through smart investing and usury lending, but she ate graham crackers all day so she could avoid New York City's costly restaurants at night. A hot plate in her shabby boardinghouse sufficed to warm her dinner.

The millionaires of the last century were at least as charitable as the billionaires of this. **Andrew Carnegie** spent most of his half-billion-dollar steel fortune on education and some 2,500 libraries around the world. He died worth a scant \$23 million. John D. Rockefeller gave away more than \$500 million to the Baptist church, education, and medical research.

If they were so generous, is it fair to call them robber barons? Matthew Josephson, who coined the term in 1934, said, "They were aggressive men. Some of them were lawless." But historians tend to be kinder to 19th-century builders. Mores were different, labor laws laxer, and income taxes nonexistent in 1913. Says David Vogel, a business historian at the University of California, Berkeley: "These people did not see themselves as unethical by the standards of the day. Of that I am certain. Like Ivan Boesky, most of the real estate moguls got caught."



Loan shark



Financier

NAME	BUSINESS	WEALTH in millions of . . .	
		yesteryear's \$	today's \$
<b>JOHN D. ROCKEFELLER</b>	Oil	<b>\$900</b> 1913	<b>\$10,000</b>
<b>ANDREW CARNEGIE</b>	Steel, railroads	<b>\$500</b> 1905	<b>\$6,030</b>
<b>MARSHALL FIELD</b>	Retailing, real estate	<b>\$400</b> 1938	<b>\$3,240</b>
<b>ANDREW MELLON<sup>1</sup></b>	Finance	<b>\$325</b> 1928	<b>\$2,000</b>
<b>MAYER ROTHSCHILD and SONS<sup>1</sup></b>	Finance	<b>\$170</b> 1875	<b>\$1,700</b>
<b>CORNELIUS VANDERBILT</b>	Steamships, railroads	<b>\$105</b> 1877	<b>\$1,170</b>
<b>EDWARD H. HARRIMAN</b>	Railroads	<b>\$100</b> 1913	<b>\$1,140</b>
<b>HENRIETTA "HETTY" GREEN</b>	Finance	<b>\$100</b> 1916	<b>\$1,040</b>
<b>JAY GOULD</b>	Railroads, finance	<b>\$77</b> 1892	<b>\$925</b>
<b>JOHN PIERPONT MORGAN</b>	Finance	<b>\$68</b> 1913	<b>\$802</b>
<b>LELAND STANFORD</b>	Railroads	<b>\$21<sup>2</sup></b> 1905	<b>\$265</b>

<sup>1</sup>Estimates by Peter Hall of Yale. <sup>2</sup>Stanford's wealth does not include Stanford University, the land it sits on, or the buildings.

## WHAT IS IT WORTH TO YOU

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Cost of goods in 1853.....

Beef .....	3 1/2 cents/lb.
Bacon .....	8 cents/lb.
Veal .....	7 cents/lb.
Flour .....	4 cents/lb.
Butter .....	33 1/2 cents/keg.
Salt .....	\$ 3.00 /keg.
Coffee .....	\$ 1.00 /3lb.keg.
Bushel of Apples .....	25 cents
Oats .....	2 cents/lb.
Plug of Tobacco .....	3 cents
Whiskey .....	6 1/4 cents/gal.
Glass of Liquor .....	10 cents
Leather .....	30 cents/lb.
Hatchet .....	37 1/2 cents
Three pounds of Nails .....	15 cents
Rat Trap .....	\$ 1.00
Horse Brush .....	\$ 1.00
Working Hat .....	87 1/2 cents
Calf Skin Shoes .....	\$ 1.75

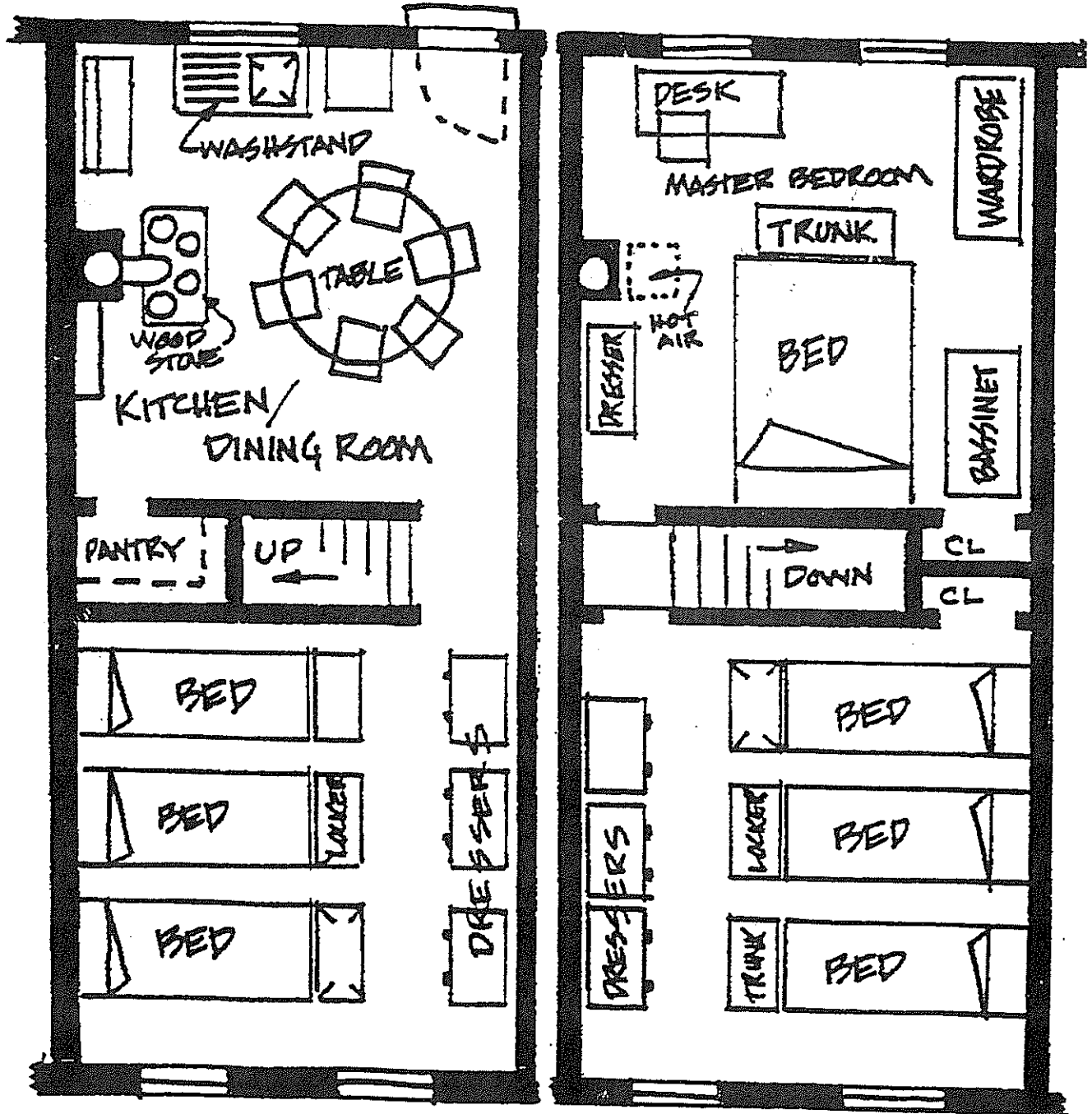
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What it took to buy these.....

One Days Work .....	45 cents
One Day pitching and raking hay .....	25 cents
One day plowing .....	75 cents
Hauling firewood for one day .....	50 cents
Cutting 1,000 fence rails .....	\$ 7.50
Re-soling boots .....	70 cents
Sawing 193 board feet of planks .....	96 1/2 cents
Cost of pasturing livestock .....	
101 Cattle .....	\$ 4.50
1.500 Sheep .....	\$ 7.50

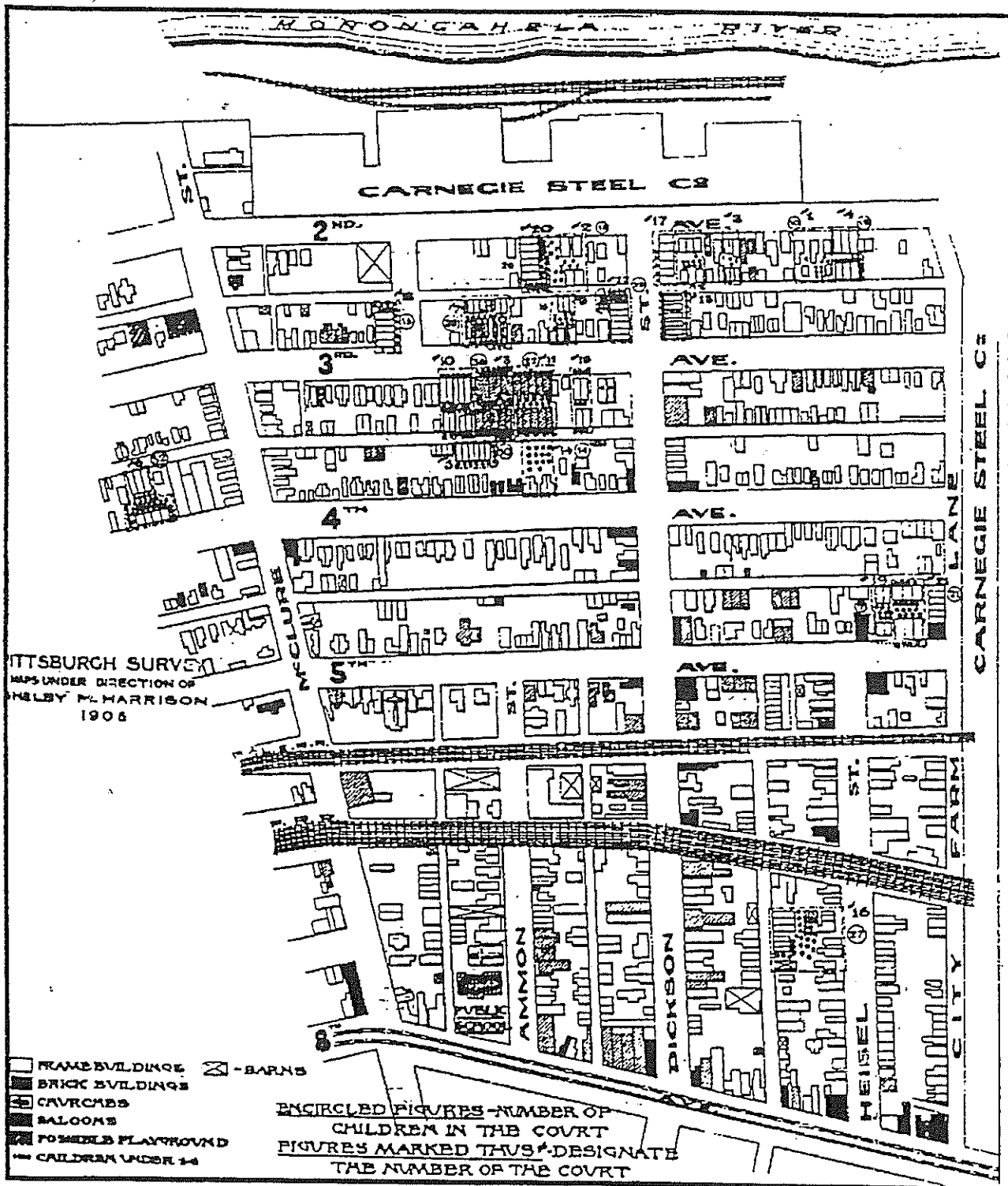
Steelworker's home  
 Floorplan  
 reconstructed from information in Margaret Byington's *Homestead: Households of a Mill Town*

From *Steel Town*, Historical Society of Western Pennsylvania, used by permission



FIRST FLOOR

SECOND FLOOR



From *Homestead: Households of a Mill Town*, Margaret Byington