Steel crisis: America marching backwards

by Robert Gallagher

The potential relative population density of the United States of America has suffered a collapse, on the order of at least 10%, in the course of the Reagan administration's "economic recovery." The horrifying destruction of the U.S. steel industry in this period, argues that this judgment is conservative.

The most recent data show that U.S. capacity to produce *new* raw steel, through the most energy-dense technologies, collapsed a huge 12.5% in 1984, from 92 million tons in 1983 to 80 million tons last year, while capacity in the backward electric-furnace "mini-mills," developed in the horse-and-buggy days, continued its anomalous rise. This means that 12 million tons of capacity, in relatively advanced furnace technology, was destroyed, and to the extent it was replaced at all, it was replaced by relatively backward technologies.

If the average energy-density of technology employed in a basic industry in a nation declines, its labor force becomes less productive, and, as a whole, cannot support the number of persons it previously potentially could. Resources must be deployed from elsewhere in the economy, away from other critical areas, to maintain the supply of products formerly produced by the regressing sector.

The effects of this decline may be postponed, but they eventually assert themselves. For example, because of this collapse in the average energy-density of U.S. steel-making technologies, the United States now imports over one-fourth of its total consumption of finished steel, at bargain basement prices. Another quarter of finished steel consumption is of low-quality production from recycling steel scrap. Thus, it appears, to those with blinders on, that the collapse has not occurred.

This collapse is not only due to the economic policies of the President's advisers; the Carter administration did much to set in motion, the processes that are ripping the guts out of America's basic industries.

New raw steel capacity is defined, as the maximum potential annual output of the principal advanced steel furnace technologies that refine molten iron, produced in blast furnaces, through the reduction of iron ore and ore products, into new steel ingots. The most advanced such process is the basic oxygen process (BOP), patented in Germany in the 1930s and developed in Austria after the war, based on the work of Ludwig Prandl's school of hydrodynamics and aerodynamics at the University of Göttingen. All other steel-making processes extant today, are obsolete by comparison. But in the "recovery" of 1982-84, U.S. production shifted dramatically into the obsolete electric and open hearth furnaces **(Fig. 1),** because, although their iron-refining capabilities are meagre, they are able to remelt (and recycle) steel scrap.

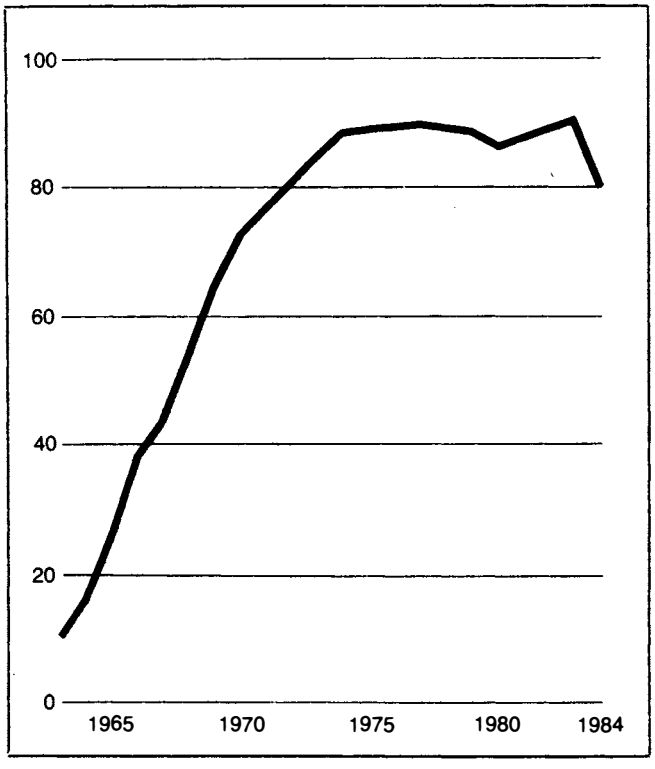
How to compare technologies

There are two simple measures of "level of technology" in steel furnaces: the energy flux through the furnace (the relative level of energy throughput it can apply to transform nature), and the steel operative's power to accomplish work (roughly measured by tonnage output per unit of energy consumption in the furnace). *The energy flux density of the BOP is 4 times higher than that of the electric furnace* and 10 times higher than that of the open hearth **(Fig. 2).** It refines 7 times more steel per unit of energy than the electric furnace and 15 times more than the open hearth.

FIGURE 1.

Capacity of raw steel production in basic oxygen furnace is now dropping

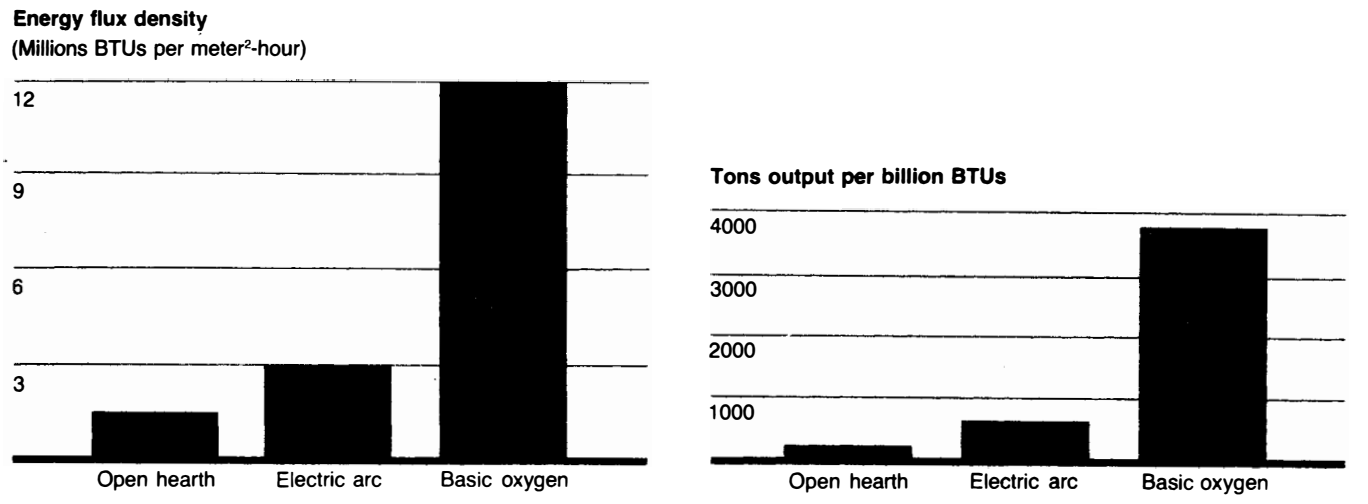
Millions net tons



Source: Association of Iron and Steel Engineers

FIGURE 2.

Basic oxygen—being cut back— is most productive steel process



Source: *EIR Spring 1985 Quarterly Economic Report.* Based on data from the American Iron & Steel Institute and other sources.

Capacity to make new raw steel is equivalent to the total capacity of BOP furnaces; one-eighth of this capacity disappeared in 1983-84, according to figures released by the American Association of Iron and Steel Engineers. The full extent of the regressive changes under way in the steel industry are not yet felt. However, *between 1983 and 1984 alone, the power of the steel furnace operative to accomplish work, fell 9.4%.*

The power of the operative to accomplish work with a modern blast furnace, is 20 times greater than the operative of an 18th-century blast furnace. That is, the tonnage output of iron for the same amount of fuel, valued by its heat-content, is 20 times greater today. This increase in power, is the result of application of higher and higher energy flux densities as the industry progressed from charcoal-fueled blast furnaces with a blast provided from a bellows, to anthracite-coal fueled furnaces with a blast driven by a steam engine, to bituminous-coke fueled furnaces, which themselves went through a series of technological transformations. As Lyndon H. LaRouche, Jr. wrote in *So, You Wish to Learn All About Economics?*:

> Imagine the hypothetical case, that two heat-powered machines consume the same amount of coal-generated power per hour, but that the operative using one of the two types of heat-powered machines has a higher rate of output than the same kind of operative using the other type. The difference between the two types of machines is a difference in the internal organization of the machines. This difference is Leibniz's definition of the subject matter of technology (in French: *polytechnique*).

U.S. steel technology is marching backwards. The "internal organization" of its equipment is regressing. From the 1950s until the early 1970s, U.S. steel companies shifted their investment in steel-making equipment, however slowly, into technologies with higher and higher energy flux densities. The average energy flux density of new steel furnaces built in 1969 was four times greater than that of furnaces built in 1953. By 1978, this trend had reversed direction. The industry focused investment in the "mini-mill" built around the obsolete electric furnace, with the result that the average energy flux density of new furnaces was half what it had been nine years earlier. As a result, steel making became unprofitable, and steel companies began to leave the steel business altogether.

The case of Armco, Inc. (formerly Armco Steel Corp.) is illustrative. In the mid-1970s, Armco diversified into insurance. Reportedly, as interest rates rose, these insurance ventures ran into trouble. Overall, Armco suffered a $1.3 billion loss over the past three years. Earlier this year, insurance regulators in New York, Wisconsin, and elsewhere, demanded that Armco's insurance companies maintain an additional cash reserve of $130 million. Armco tried to divest itself of the insurance companies with no success. Now the company is trying to raise the cash, by selling its advanced aerospace divisions, to other insurance companies(!), and is offering parts of its steel assets, for sale to employees.

Early in April, it announced layoffs for one-quarter of its white-collar employees, at its world headquarters in Middletown, Ohio. As Armco teeters on the edge of bankruptcy, it has, according to a congressional source, plenty of company. Reportedly, Jones and Laughlin/Republic steel is about to file for bankruptcy, and other companies will soon follow.